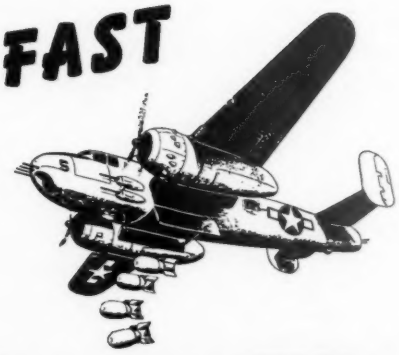
AMERICAN GAS

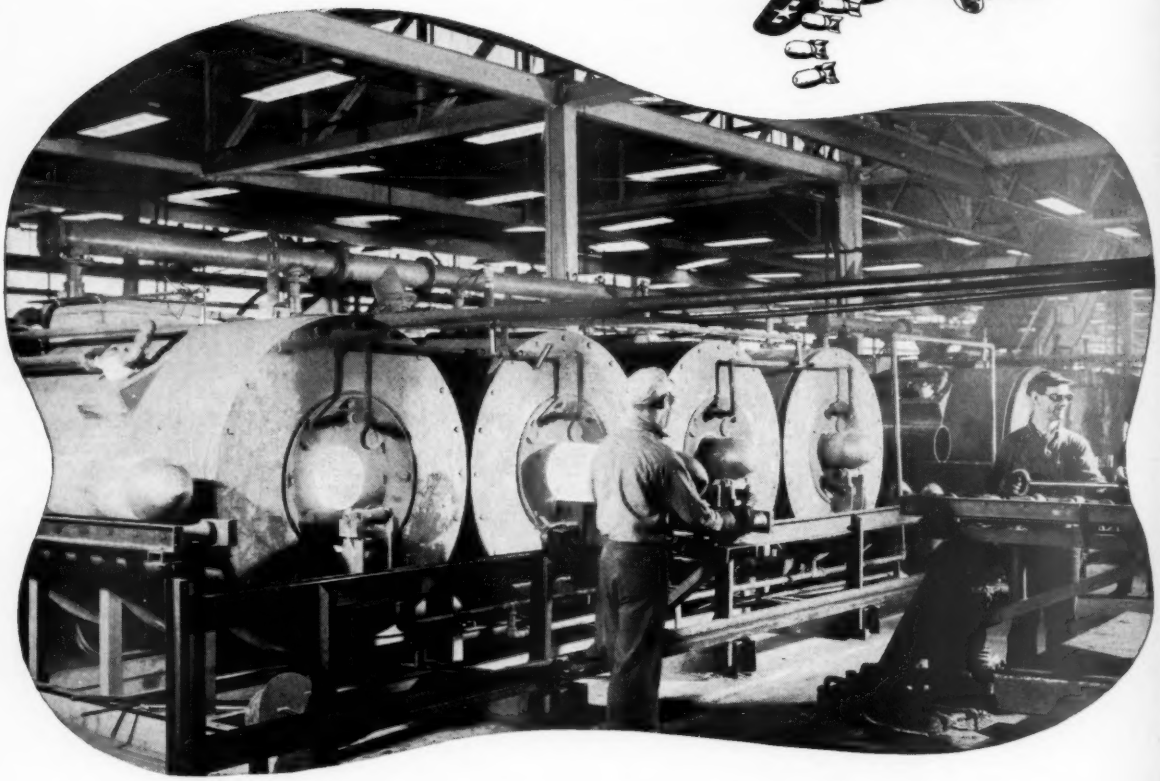
Association

MONTHLY

MAY 1945 · VOL. 27 · NO. 5

ALL-PURPOSE BOMBS roll off the line FAST with GAS





When the Scaife Company, Oakmont, Pa., were called from peacetime manufacture of range boilers, tanks and cylinders, to turn out all-purpose bombs, they unhesitatingly chose Gas fuel for their new equipment. In forging and spinning these bomb-nosings, speed, accuracy and high fidelity to Government requirements were attained with Gas.

In the words of Mr. R. G. Taylor, Secretary of the Company—

"We liked the easy and effective way we were able to apply gas fuel to our various production methods for many years before the war. When the problem of building for war production came, we felt no uncertainty in making gas the choice for these new bomb-nosing furnaces. Gas has carried us through nicely, as we expected it would, and has simplified our job of meeting Government specifications for all-purpose bombs."

When civilian requirements can once more be filled, Gas will do an equally good job. Be ahead, consult the Industrial Gas Engineer of your local Gas Company, now.

AMERICAN GAS ASSOCIATION
INDUSTRIAL AND COMMERCIAL GAS SECTION
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

THE TREND IS TO GAS
FOR ALL INDUSTRIAL HEATING

BUY WAR BONDS—HELP SPEED VICTORY!

One of the current advertisements in the American Gas Association's national industrial and commercial gas campaign

The ceremony marking the reopening of the A. G. A. Laboratories is doubly significant. First, it is indicative of the vitality of an organization which can bound back from a major physical disaster without suffering tremendous loss of efficiency. Second, it heralds the dawn of a new day in gas research as it coincides with the launching of our industry's most ambitious national program. . . . Despite the handicap of records destroyed, working in strange quarters, and the general confusion, the Lab's personnel hardly missed a stride in keeping abreast of their work. They have met war contracts, continued appliance testing, prepared papers for technical conferences, and perfected long-range research plans. An orchid to Ray Conner and his able staff! . . . When a well-qualified Texan speaks his mind on the present controversy involving natural gas conservation, it is noteworthy. Not only has Mr. Schmidt no ax to grind for long distance gas transportation, but, as an A. G. A. past chairman, he knows the overall picture thoroughly. With a basic national policy coming up for revision, it is a timely contribution. . . .

EDITORIAL OFFICES:
AMERICAN GAS ASSOCIATION
420 LEXINGTON AVE., NEW YORK 17, N. Y.

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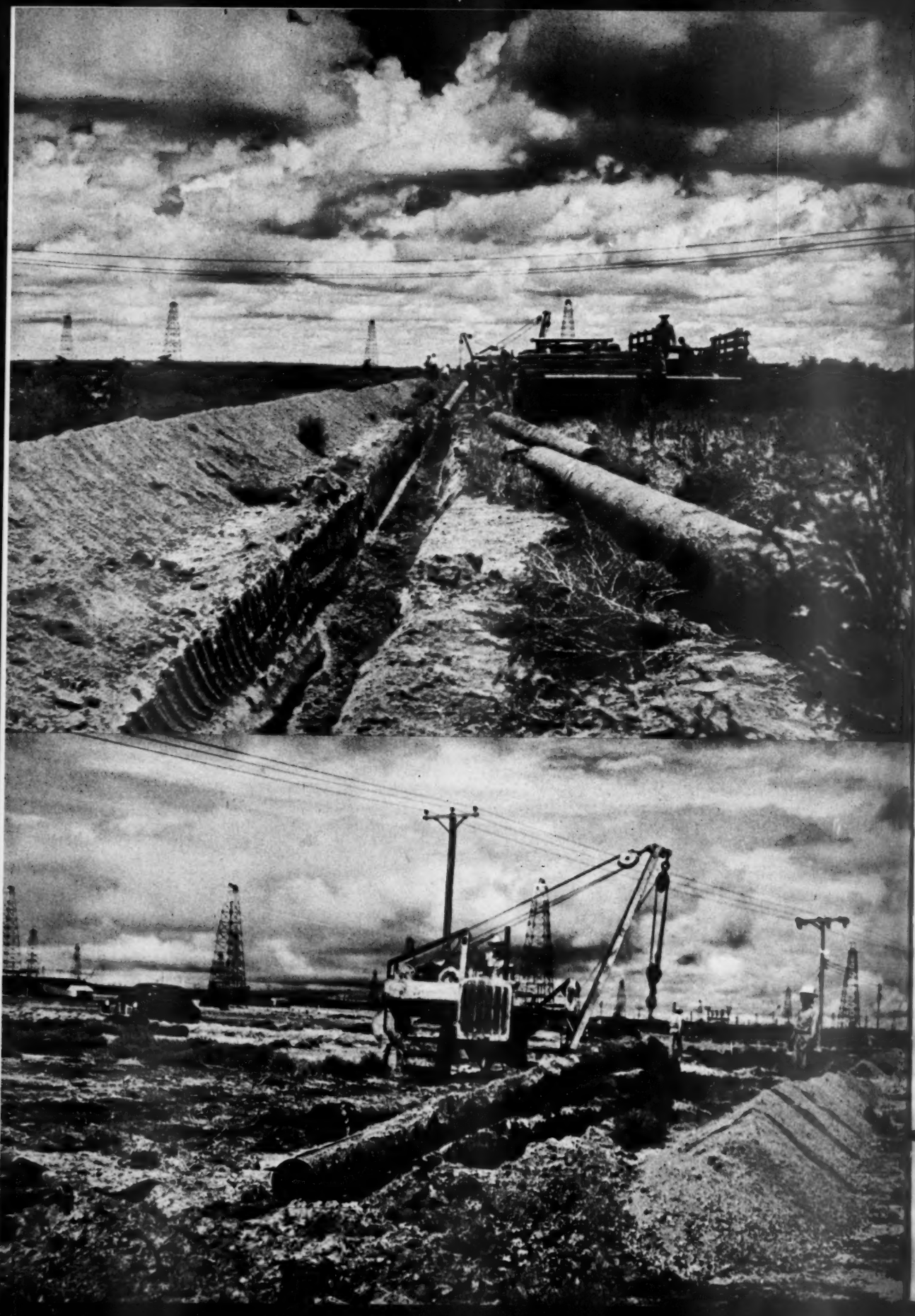

JAMES M. BEALL, *Editor*

Laboratories' Cornerstone Relaid

SPEARHEADING the gas industry's large new research program, the American Gas Association Testing Laboratories in Cleveland completely reoccupied their former quarters on April 12, thus again centering all Cleveland operations in one place after having maintained separate temporary offices for six months after the Cleveland gas fire.

J French Robinson, president of the American Gas Association, relaid the Laboratories' cornerstone just 17 years after the building had been erected under the chairmanship of a former East Ohio Gas Company president, R. W. Gallagher, now chairman of the board of the Standard Oil Company of New Jersey. The Laboratories were originally established in 1925.

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Mr. Gallagher, who was unable to attend the ceremony, wrote that he was tremendously disappointed at not being able to do so. "I have always had great admiration for what you and your associates have done in building a great gas laboratory from the ground up," he stated in a letter to the Laboratories' director, R. M. Conner. "It has been a most outstanding contribution to the public as well as the gas industry, and one of which you all can be very proud. So, not being able to be present, all I can do is to wish you Godspeed, knowing that the great work you have started will continue for many years to come."

Among the some 200 guests attending was Robert B. Harper, vice-president, The Peoples Gas Light and Coke Company of Chicago, also a member of the first Laboratories' Managing Committee and for many years chairman of the Approval Requirements Committee. Mr. Harper was called on for a few remarks by George E. Whitwell, present chairman and vice-president in charge of sales of the Philadelphia Electric Company, who acted as master of ceremonies. Members of the Laboratories' Managing Committee meeting with Mr. Whitwell prior to the ceremony for an inspection of the building were Charles E. Bennett, president, The Manufacturers Light and Heat Company, Pittsburgh; N. B. Bertolette, president, The Hartford Gas Company; C. H. Waring, vice-president and general manager, The Wyandotte County Gas Company, Kansas City; and Mr. Conner. A. F. Bridge, vice-president and general manager, Southern Counties Gas Company, Los Angeles, was unable to be present. Mr. Waring is also chairman of the Approval Requirements Committee which met the following day at the Laboratories.

Executives of the American Gas Association attending besides President Robinson included E. J. Boothby, first vice-president; Major Alexander Forward, managing director; and George A. McDonald, director of publicity. Lyle C. Harvey, president, The Association of Gas Appliance and Equipment Manufacturers, represented his organization. The American Society of Heating and Ventilating Engineers was represented by Professor G. L. Tuve, chairman of its Research Committee. A number of manufacturers of gas appliances and equipment in the immediate vicinity of Cleveland likewise attended.

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Of the Laboratories' staff of 27 at the time the building was erected in 1928, half are still active in the gas industry. Five, R. M. Conner, F. E. Vandaveer, K. H. Flint, F. A. Allen and F. R. Wright, are still members of the staff. Nine are employed either with utilities or manufacturers. Two are known to have passed away. Those in the gas industry include C. S. Stuckenholt, vice-president, and N. J. Reiff, production engineer, The W. J. Schoenberger Company; Otto Lutherer, chief engineer, The North American Company; H. W. Heywood, chief engineer, Bastian-Morley Company; W. M. Couzens, chief engineer, Gaffers & Sattler; J. Corsiglia, utilization engineer, Surface Combustion; R. C. Gregg of The Bryant Heater Company; A. F. Craver of The Patrol Valve Company and G. B. Shawn of the Silex Company.

For nearly 20 years the Laboratories Approval Seal has distinguished gas appliances of merit. Such equipment has

• Opposite: Wartime conservation in the natural gas area—Views of take-up and salvage operations involving Lone Star Gas Company's 12-inch line from Big Lake to San Angelo, Texas. Photographed by W. A. Allred, asst. safety supervisor, Dallas.

View of American Gas Association Testing Laboratories in Cleveland

President Robinson laying cornerstone with George E. Whitwell, Laboratories' Managing Committee chairman, and R. M. Conner, director, looking on

PRESIDENT ROBINSON'S REMARKS

"I can think of nothing more inspiringly American than the simple little ceremony which brings us here on this occasion. We relay this cornerstone, but nothing is being revived or resurrected or rededicated. The inspiration and the purposes which are symbolized in this cornerstone, are continuous and have never known interruption.

"The motive which inspired the creation of this great institution of research, is the American spirit in all its purity and in all its aggressive search for a better future. The event which required the physical reconstruction of a building and the restoration of its equipment, did not at all affect the urge for a better life which found expression in the establishment of these laboratories back in 1925.

"It is also good Americanism, as we find it shown here today, that, while the physical work may have to wait awhile for mechanical reasons, good ideas never take a minute off. I am sure the thinking and the planning which have resulted in the great work of these laboratories, have gone right on during this lull in physical effort which was caused by the fire. We are justified in expecting a continuing increase in the brilliantly effective impetus which the laboratories have given to the gas industry.

"The American Gas Association Testing Laboratories have been an immense success. Their success will continue—and will continue to increase, because they are dedicated to human helpfulness."

advanced materially the comforts of modern living until today the four big household jobs of gas—cooking, water heating, cooling and heating—have become almost completely automatic functions.

The Laboratories, dedicated in 1925 to the promotion and development of the gas industry to the end that they may serve to the fullest possible extent the best interests of the public, today stand as a symbol of American enterprise unique in the annals of business history.

Pioneered in Self-Regulation

The American Gas Association not only pioneered in the establishment of nationally recognized standards for appliances and their constant elevation, but by the founding of its Laboratories as an approval agency distinguished the gas industry as one of the very few in the annals of business to successfully achieve self-regulation in the interest of the public welfare.

Safety, satisfactory performance and durable construction are still the keynote of approval standards as they were in the beginning. As the result of their application in our Association's appliance testing program, today more than 95% of all gas equipment sold bears the Laboratories' Approval Seal. Quality control is the watchword. In keeping with the advances of modern science, the Laboratories render a national service in determining technical soundness of construction and acceptability of performance of domestic equipment using gas fuel.

Today, research endeavors have been

stepped up until they are three times the level of a few years ago. It is significant that in the last 10 years more improvement in gas-burning equipment has resulted than had taken place in the previous forty years. The foundations being laid today will bring additional technical advances, paving the way for even greater achievements in the days to follow.

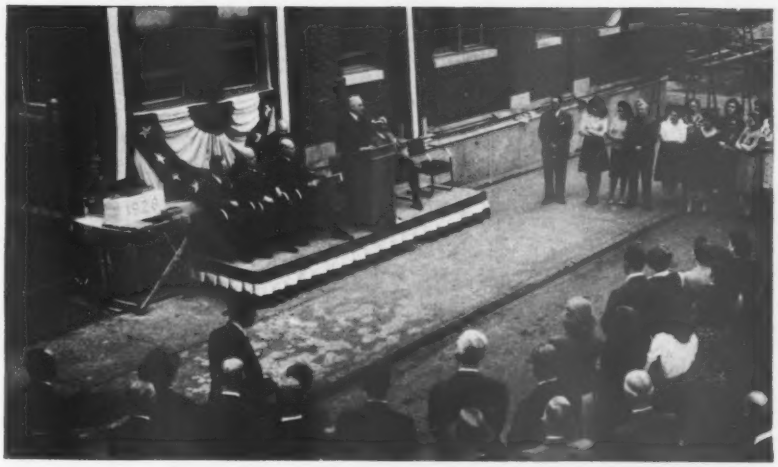
Engineering to sound national standards has become an established tradition, benefiting both the gas industry and its 80,000,000 consumers. Continuous, aggressive exploration of the sciences and diligent experimentation underlie the Laboratories' fact-finding activities. These in turn are translated into consumer benefits, comforts and conveniences by our manufacturers. Research is directed towards the constant strengthening and elevation of test procedures and the development of new basic principles and concepts.

Research Highlights

Development of single point automatic flash tube ignition for oven and broiler burners, formulation of basic gas burner design techniques, and the current investigation of kitchen ventilation represent some of the highlights of recent domestic gas research endeavors. Studies in immersion tube heating, typical of industrial research, further advancements in the mixing of gases for better and more effective utilization, and fundamental air conditioning studies which prepare the way for gas to take the lead in this rising new business all represent outstanding examples of what research has contributed to the welfare of the industry.

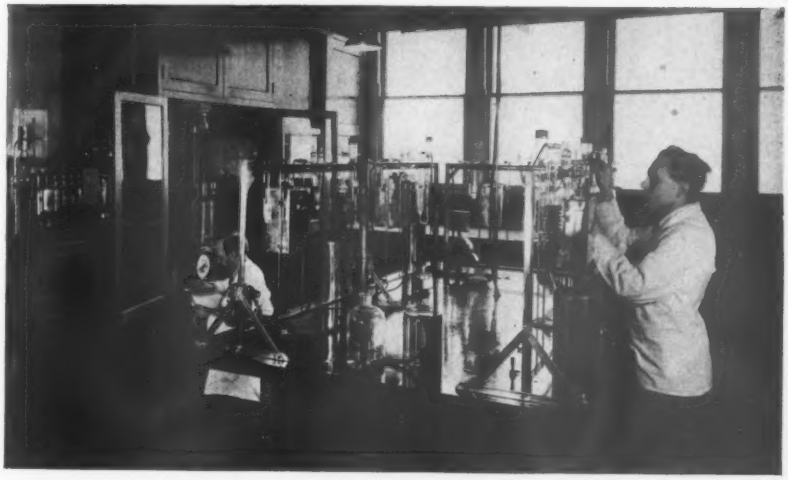
During the war, of course, many regular functions of the Laboratories have been drastically curtailed. Their scientific "know how," research facilities and capable staff, however, have stood our country in good stead.

Experimental and research activities resulted in the development of a number of devices for the control, indication and detection of various gases as used for war purposes, particularly oxygen and helium. Attesting to the unique character of this war work was the design of an automatic oxygen regulator for transport planes, a hospital plane regulator for use in transporting wounded, helium retention and purity instruments, and a



Major Forward, A. G. A. managing director, addressing the crowd during the ceremony

Association officials and guests at cornerstone relaying luncheon



Restored chemical laboratory in full operation

number of regulators for flow control under special circumstances. Altogether a total of fourteen separate devices were developed for our country's armed forces.

The success attained by the Laboratories in the conduct of their first large contract for continuous flow automatic oxygen regulators for transport planes is well proven by their award by the Army Air Forces a few months ago of a second like contract covering a newer improved design. These regulators are now in use wherever mountains or weather conditions require flight at high altitudes.

Complete reoccupancy of the building, centering all operations and activities in a central quarters places the Laboratories in a position to go ahead with both their war work and their testing and research activities in an efficient manner, preparing the way for the postwar period and supporting the 52 former members now in service on the battlefields and high seas.

Three Domestic Gas Research Conferences To Be Held in May and June

F. M. Banks

LOCAL Domestic Gas Research Conferences will be held in three cities this spring instead of the national type formerly held, according to F. M. Banks, chairman, Committee on Domestic Gas Research, American Gas Association. This change is necessary to comply with regulations of the Office of Defense Transportation which limits out-of-town attendance to not over 50 persons. The local conferences have been specifically authorized by the Executive Board.

Conferences will be held in Cleveland, Ohio, Hotel Statler, May 8 and 9; New York, Hotel Pennsylvania, May 23 and 24; and Chicago, Illinois, June 6 and 7. The objective of the conferences is to present to appliance manufacturers the results of research conducted under the committee's auspices that cannot be covered in reports or bulletins. Also to provide manufacturers, engineers and designers opportunity to analyze and discuss technical material and to question members of the Laboratories' staff who are conducting the various research projects.

Panel sessions devoted to gas cooking research, gas water heating research, and gas house heating research will be held each day. These will be conducted by the Technical Advisory Subcommittees headed by Paul R. Tappan, L. R. Mendelson and Keith T. Davis. Sessions devoted to recent technical developments in gas burners will be featured, as will the technical features of kitchen ventilation.

Invitations have been extended by the Committee on Domestic Gas Research to appliance manufacturer companies beyond the commuting areas of the cities, in accordance with O.D.T. regulations.

The Technical Advisory Subcommittees for Gas Water Heating Research and for Central Space Heating Research will meet at Hotel Statler, Cleveland, on May 7, the day before the conference and the Technical Advisory Subcommittee for Gas Cooking Research will meet at the A. G. A. Laboratories on May 10 the day following the conference.

On May 7 and May 10, the Laboratories will be open to the delegates attending the conference at which times the research staff will be available for consultation.

THE CINDERELLA GAS INDUSTRY

SOMETIME back the *Wall Street Journal* (Pacific Coast Edition) carried a front page story on all-electric homes in the TVA area. Later the same paper printed a series of articles on the development of far western industry during the past fifteen years. In this series the natural gas industry was mentioned in a few paragraphs tacked on to an electric industry story. More recently it carried a story on electric house heating in the Pacific Northwest.

The Pacific Advertising Association recently distributed a booklet dealing with West Coast products. Gas and gas appliances were mentioned not at all although there were articles on electrical equipment and markets and one table showed that of all products manufactured in the West "stoves, ranges and heaters" achieved the highest percentage of national production. It was not explained that these were gas appliances.

In the many "Kitchens-of-the-Future" stories appearing in the popular national magazines it is usual to read of the wonders of the automatic electric gadgets. The authors have apparently never heard of the automatic gas range.

This neglect by legitimate publicity media is not the fault of the media. It is the fault of our industry. We have let the "all-gas" home become a commonplace; we have nowhere developed the romance and importance of gas service to our community; we have failed to collect the statistics to show that our appliance manufacturers outmake and outsell our combined competitors. The Gas Industry has not learned to put its best foot forward. It has not mastered the canvasser's art of putting its foot in the door.

Let us start the postwar period with the hope that our western companies will wholeheartedly support the new A. G. A. promotional program and that the A. G. A., adequately financed at last, will be at least as smart as our competitors in telling its industry's story. The job that needs to be done must be done nationally with every possible regional and local follow-up. The industry needs more heart-interest publicity; it needs a whole library of sound and color promotion pictures, each one telling one phase of our story; it needs closer coordination between manufactured and natural gas interests and between these and appliance and equipment manufacturers. Above all it needs more "umph" and less "sit-and-take-it."

We have the goods—let's tell our customers so that our industry may have the opportunity of doing its proper share in the reconstruction of our nation's peacetime economy.—*Pacific Coast Gas Association News Letter*

How London Gas Utility Weathered War Storm

THE company suffered very severely during the air attacks on London in 1940. Practically all our works were damaged, gasholders were destroyed and many mains broken. The highest praise is due to the courage, resourcefulness and tenacity displayed by the staff.

A large number of people left London and our consumption fell by about 17 per cent., while expenditure was necessarily high. We were unable to pay dividends for the second half of 1940 and the whole of 1941 and incurred a deficit in paying debenture interest.

At the beginning of the war the price of gas stood at 9.75d. per therm, but the company was forced to raise the price by 2½d. per therm in November, 1939.

It was not until March, 1942, that the Government authorized us to charge an additional 1½d. per therm. In August of the same year we were again forced, by increases in the price of coal, to make a further increase of ¼d. per therm. The price of gas has been increased by 44 per cent., whereas the pit price of coal has risen by 100 per cent.

(From annual report of The Gas Light and Coke Company, largest gas company in the world)

Exportation of Natural Gas

A recognized authority holds that use of natuarl gas should be encouraged under proper controls after waste is curtailed

Intense interest by state and federal authorities in conservation and utilization of natural gas make this discussion timely. The author is a past chairman of the Natural Gas Department of the American Gas Association and is widely known for his many constructive contributions to the gas industry. This article first appeared in the April issue of the magazine "Dallas."

BY ELMER F. SCHMIDT

Vice-President, Lone Star Gas Co., Dallas, Texas

Elmer F. Schmidt

THE current discussion in reference to export of natural gas from Texas to other states seems to be centered on the thought that such transport of gas out of the state should be restricted by some means and that the gas should be kept in the ground here in Texas. In the opinion of this writer this theory of restricting the exportation of natural gas is based on the wrong viewpoint.

1265-mile Texas-W. Virginia natural gas line of Tennessee company supplying eastern markets

The use of natural gas or any other resource should not be restricted but should be encouraged under proper controls. What should be restricted and absolutely eliminated, if possible, is the wastage of natural gas in Texas. It is on this that we should center our attention, rather than on restricting the use of gas. Some facts concerning this wastage, its volume and its causes will throw light on the real problem which confronts the citizenship of Texas in the conservation of our natural resources.

Considerable wastage of natural gas at present occurs in connection with operation of oil wells. In many oil fields the gas drives the oil to the surface and then is burned in a flare in the open air. To the extent that it has been used for bringing oil out of the well it has not been wasted, but some means should be found to capture this flared gas and make use of it as fuel.

The exact amount of gas which is wasted in this manner is in some doubt, but the latest available figures indicate that somewhat less than one billion cubic feet a day goes into the air; probably only half this amount. Not by any means is all the gas produced with oil wasted in Texas. Many natural gas companies save and market tremendous quantities of this gas after it has served the useful purpose of producing oil, our most vital war product.

In the production of oil, in many instances, as stated, gas is the motive power lifting the oil to the surface. Some oil is produced with very nominal gas-oil ratios, probably not in excess of the gas in solution in the oil. Under other conditions gas-oil ratios may reach and exceed 10,000 cubic feet of gas to the barrel of oil. In many oil fields a gas cap exists above the oil strata and unless this gas is capped off or the well perforated only in the oil strata, high gas-oil ratios are likely to prevail. This casinghead gas is generally at a pressure much below the pressure maintained in gas transmission lines.

In recent years, with the advent of the electrical logging of wells giving the operator more information as to the exact location of the producing horizon and with the rather recent practice of cementing casing through the formations, it has been possible for operators to perforate the wells in the oil producing formation below the gas-oil contact, thereby completing the well with low gas-oil ratio. This in itself has brought about considerable reduction in waste of gas in the production of oil.

Wherever the quality of casinghead

gas has been suitable for domestic consumption and where the gathering of such casinghead gas is economical, gas companies generally have utilized the casinghead gas by compressing it into their transmission lines in preference to producing dry gas, which can be retained in the reservoir.

A specific example of this condition and of the successful conservation of gas exists in an East Texas field. This particular field has both gas and oil wells scattered through an area of 14,000 acres. Early in its development a considerable amount of casinghead gas was produced from oil wells in the northern part of the field and a large natural gas transmission company assisted a natural gasoline company in the erection of a gathering system, gasoline extraction plant and booster compressor station to make this gas available to the transmission pipe lines. This resulted in the saving of about 8½ billion cubic feet of gas which had served its purpose in lifting oil to the surface.

Casinghead Gas Saved

In this same field the principal producing company converted one of their compressors, which had been used in cycling gas, to compress other casinghead gas into the pipe lines of the transmission company. The transmission company also erected a compressor station in another part of the field to gather the remaining casinghead gas, which normally would be wasted but is now saved by being boosted into their transmission lines and carried to markets.

These three operations result in practically no waste of gas in this large field, and it was through the cooperative effort of all parties concerned that this was made possible.

The total casinghead gas produced and saved for markets in this field from 1935 to date is in excess of 52 billion cubic feet and during the same period only 33 billion cubic feet of dry natural gas was produced.

In another area in Central West Texas covering several counties this same transmission company cooperating with several natural gasoline companies has gathered, treated, compressed and saved 240 billion cubic feet of low pressure casinghead gas during the period from 1923 to date. The saving of this casinghead gas is a real contribution toward the conservation of our natural gas reserves. Other similar examples could be cited.

Recently the Railroad Commission of Texas, after a state-wide hearing on the waste of gas, appointed an engineering committee to make full and complete investigation of every field in the State of Texas where gas was allowed to blow into the air. This committee will bring to the commission the location and all pertinent engineering data including quantity of all casinghead gas now being vented to the air. With these facts known, a reasonable solution of the problem of waste may be developed. This is a forward step in the conservation of casinghead gas.

The utilization of natural gas for fuel must be encouraged and not discouraged if we are to realize its full value. It is just as reasonable to say that the exportation of oil from Texas should be stopped as to say that sale of Texas natural gas in other states should be restricted or eliminated. Where would the oil industry have been and what would have become of the great revenues which the state enjoys from this great industry, if these restrictive proposals had been applied to the production and sale of oil? The oil industry has developed in Texas because it had the necessary freedom of action. The large investments made in oil lands, wells, pipelines and refineries, the many people employed in Texas by the petroleum business, are the result of encouraging the use of petroleum products.

The amount of gas which is now being exported from Texas is very small in comparison with the total production and with the total known gas reserves in the state. The presently known recoverable gas reserves approximate 80 trillion cubic feet as of December 31, 1943, which are the latest available figures. In 1943 natural gas production amounted to approximately 1⅓ trillion cubic feet, not including gas furnished to carbon black plants and wasted. At this rate of production the presently known recoverable gas reserves are sufficient for about 62 years. However, it is predicted that additional reserves will be discovered and in view of this it is estimated that the natural gas reserves of Texas will last for several generations.

Oil Reserve Exhaustible

As compared with this, it is estimated that at the present rate of production the state's oil reserves will last approximately 19½ years. Both oil and natural gas are exhaustible resources but no one is demanding that the exportation of oil from Texas be stopped although the oil reserves are much less than the gas reserves.

The United States Bureau of Mines reports in its summary of the natural gas statistics for 1943 that Texas is transporting gas to nineteen other states and that the total volume exported to those states for that year was about 300 billion cubic feet. On the other hand, four states were transporting gas into Texas.

One large company serving north Texas, for many years depended upon natural gas transported from Oklahoma, Louisiana and New Mexico. From 1918 to 1924 a very large percentage of the natural gas supplied to Dallas and Fort Worth and intervening areas in Texas came from Oklahoma. The amount thus imported ranged from 67 per cent a year

The Flame Burns Brighter

THE war record of gas is enviable. Officials in Washington have publicly praised this industry for its leadership in such important activities as education of consumers in nutrition and fuel conservation.

Throughout these years the full-time staff and the volunteer officers of the American Gas Association have contributed a high degree of leadership in solving war problems, continuing basic research, and initiating advertising and promotion to assure gas of its rightful supremacy in the postwar world. Of equal importance is the splendid regional work done by such organizations as the New England and Pacific Coast Gas Associations.

We are therefore happy to learn that the Southern Gas Association will be reorganized and revitalized, with a full-time managing director. Intensive local, state and regional activities will free the A. G. A. of details so that it may concentrate on the highest national objectives.

The gas flame is burning brighter in each community, state and region. A stronger, more imaginative national industry will be the inevitable result, despite the uncertainties that face all of us after the war.—Editorial in *Gas Age*, April 5, 1945.

to 79 per cent of all the gas obtained by this company. Today the state of Oklahoma continues to supply a considerable amount of gas to Texas customers. The city of El Paso is wholly dependent upon natural gas transported from New Mexico. Substantial quantities also are transported into Texas from Louisiana.

The matter of retaining the gas in Texas in order to promote industrial development is brought to the fore in practically all of the discussions. In this connection it must be remembered that fuel costs represent but a small percentage of the total cost of manufacture and distribution. It is estimated that in most cases this cost does not exceed more than five per cent of such costs.

There are other prime factors which influence the location of industries. Some of them are: The attitude of the state government toward business as evidenced by its regulatory and tax laws; the availability of labor; transportation facilities; and location with reference to markets. Texas for many years has had an abundant supply of gas and yet has experienced no great industrial development because of that fact alone. Few industries other than those directly connected with oil and gas production have located in the Panhandle, although it has had one of the largest gas fields in the world. The location of industries must, of course, be made where there is an abundance of fuel at reasonable prices, but fuel is not the primary consideration.

State Cannot Prohibit Sale

From the legal standpoint there is no question that Texas is estopped from prohibiting the sale or transportation of natural gas in interstate commerce. Under our national constitution, commerce between the states can be neither prohibited nor regulated nor directly taxed by the states. Texas, governmentally and economically, is a part of an indissoluble union. In 1907 the state of Oklahoma passed a law which in effect prevented the export of gas from that state and the United States Supreme Court held the law unconstitutional. The highest court in the land in numerous similar cases has held that such restrictions of interstate commerce are unconstitutional.

The discovery of the present natural gas resources of this state would have been delayed for many years, perhaps forever, if the value of natural gas as a fuel had not been recognized and encouraged by those engaged in the business. The ability to move natural gas in interstate commerce for use as fuel to distant markets has resulted in the development of many of the great natural gas fields in Texas, has brought tremendous wealth to the people of Texas, and has been instrumental in reducing waste.

Texas need have no fear of a shortage of fuel. Not only is it assured of an adequate supply of gas for at least sixty years and perhaps longer, but it is assured for a long time to come of adequate supplies of oil There has been and is now being developed within and adjacent to Texas large hydro-electric power projects. These, together with the existing electrical generating plants, assure to Texas a large amount of cheap electric power. Texas has large quantities of bituminous coal already located in the counties of Wise, Jack, Palo Pinto, Erath, Young, Eastland, Coleman and others. Millions of acres of high-grade lignite, which has proved to be a splendid fuel, are known to exist in Texas. There is no reason to doubt that Texas can develop these vast reserves of coal and lig- *(Continued on page 244)*

The Gold Badge of Courage

A pair of servicemen register approval of the new signboard sponsored by The Hartford Gas Company which publicizes the honorable discharge pin awarded to servicemen and women

BY DON SCHIVELY

ONCE a veteran has taken off his uniform, a tiny gold button is his or her only insignia of service. This service emblem indicates that the wearer has been honorably discharged after performing a duty to the country in time of war.

Many heart-breaking incidents have occurred, and many tensions caused through failure of the public in general to recognize this insignia. Everyone should know what it is and what it represents.

From conversations with discharged veterans, there appears to be a growing feeling of "What's the use of wearing the button—nobody knows what it is anyway." This is a sad commentary on our failure to appreciate this symbol. The public should take a good look at this button and be able to recognize it at a glance. It's an emblem of service to all of us—a sign of a job well done.

The Hartford Gas Company has taken a long step toward educating the local citizens to recognize this button which thousands are wearing now and thousands more will be wearing before many weeks pass. One of its most prominent billboards is telling the story of "The Gold Badge of Courage."

New-Type English Top Burners

Non-aerated gas burners are operating satisfactorily in England and show interesting results in American tests

BY C. GEORGE SEGELER

Engineer of Utilization, American Gas Association

MANY of us who have had the opportunity of following the English gas trade journals have read with interest of the non-aerated burners developed by Dean Chandler of the South Metropolitan Gas Company of London. However, until recently no actual burner of the type which has already found considerable acceptance in England was available in the United States for examination and test. Through the courtesy of the West Gas Improvement Company it was possible to secure from Mr. Chandler one of these new burners and to test it under American conditions.

Figure 1. Current-type English gas range

Figure 2. Range top with grates removed

Figure 1 shows a current type of English gas range designed with the new non-aerated burner. These burners are used for the top section, for the griller and in the oven. The picture shows the assembled range which has a portable griller (intended for uses similar to American broilers). This griller may be placed on an adjoining table but most users prefer it in the position shown on the platform on top of the range where the food can be grilled under observation. The picture also shows the gas lighting torch which is ignited, as necessary, at the permanent pilot light which can be seen on the right of the range at the top. There is a simplified oven heat control as well as a row of gas burner controls on the back panel.

The behavior of the non-aerated type of burner has been highly satisfactory in England, according to Dean Chandler, and a large number of ranges fitted with them have been in constant use for several years without trouble. Of course, the grates for the top burners had to be designed to fit this type of burner application.

Figure 2 shows a closer view of the range top with the grates removed so as to show the non-aerated burner heads and the polished reflectors under them. The burner itself is shown in greater detail in Figure 3. As can be seen quite readily, there is a small top disc on which utensils will rest and under it are eight or ten burner tips, each of which consists of a small brass housing screwed into the conical head. Each tip is made of a special ceramic material shaped so that each burner forms a flat disc about the size of a dime and tilted slightly upward from the horizontal. Therefore, there are eight or ten flat bright blue flames slightly separated from one another.

The individual flame is particularly interesting because the gas slot cut in the ceramic head is in a vertical position while the flame it produces is horizontal. The little slots are .032 inches in the long direction and have a width of exactly .016 inches. The ratio of slot length to width is approximately 2 to 1. Investigation of this type of burner by the A. G. A. Testing Laboratories has indicated however that greater slot length to width ratios can be satisfactorily employed. It is interesting to note that the width, .016 inches is identical with the diameter of a No. 78 drill which was found to be the size required for non-aerated blue flame burners having drilled round ports. The independent investigations in England and the United States have both led to the same conclusion regarding size insofar as operation with manufactured gas is concerned.

Figure 3. Close-up of non-aerated gas burner showing ceramic burner tips and tiny gas slot somewhat similar to the former Bray burner

To return to a description of the ceramic tip, careful examination of the tip which can be seen just right of center in Figure 3, shows that the ceramic portion has a slight concavity. It was first surmised that this was the means by which the flat horizontal flames were

produced. A closer examination of the burner tip revealed that the horizontal flames 90° out of phase with the length of the slot are produced by so constructing the burner port that the short sides of the slot form a sharp-edged orifice and the long sides are formed by a channel. By improving this type of construction there is considerable contraction of the gas flow between the two short sides and thereby a flat horizontal flame is produced. Tests conducted on a number of burners fabricated at the A. G. A. Laboratories with rectangular ports employing this alternate sharp edge and channel-type construction indicate that considerable flexibility in the type of flame produced can be obtained by the amount of "sharpness" and the length of channel given to the port edges.

In developing this type of burner in England there were two major problems. First, to produce a jet which would burn gas efficiently and second, to assemble such jets in a way that the resulting flames would be suitable for use in domestic appliances.

For the English gas conditions it would certainly seem that great strides had been made. However, it should be borne in mind that these jets are not intended for universal use. They are specifically designed for a straight coal gas, stripped of benzol, 530 B.t.u. per cubic foot, and a specific gravity of .40. The jets are intended for use in London where the pressure averages three inches.

The burners of this type tried in the United States show how sensitive the design is on varying types of gas. It was first tried in Brooklyn on a mixed type of manufactured gas including coke oven, carburetted water and oil refinery gas in varying proportions and with considerably higher gravity as well as somewhat higher heat value than the English specifications. On this gas the burner flames showed a tendency to produce yellow tips which has been interpreted by Mr. Chandler to be due to the higher percentage of methane and illuminants in Brooklyn gas and the higher specific gravity. There was also a tendency for the tips to operate in a noisy manner when hit by a draft. This is also to be expected considering the differences in the test gas from the composition of the gas for which the burners were designed. Apparently the jets function satisfactorily with variations in the characteristics of the gas plus or minus about 10%. The burner dimensions required for gases substantially different from that served in London would have to be determined by further tests.

When this same burner was tested at the A. G. A. Testing Laboratories in Cleveland, it was found that it would not work satisfactorily on natural gas as anticipated but worked quite well on the synthetic coke oven gas employed at the Laboratories. This also appears to check with Mr. Chandler's observations on the sensitivity of this burner head to gravity and hydrocarbon variations.

Mr. Chandler is most enthusiastic about the possibility of this type of equipment. He states that all his experience in recent years has led to the conclusion that, for domestic equipment and even for some commercial and industrial applications, this type of burner which he calls the "neat-gas" burner is preferable to the Bunsen burner because it simplifies design and reduces burner and appliance maintenance.

Hartford Takes to the Air

IN addition to a strong newspaper campaign on the "CP" gas range in postwar kitchens, the Hartford (Conn.) Gas Co. is using radio to plug New Freedom Gas Kitchens and year 'round air conditioning. Eleven spots each week on three local stations is the present schedule. Here is a typical message:

"Look what's ahead! More freedom—more fun for you, Mrs. Housewife—when Gas—the Magic Flame—comes into your home! Comfort and convenience beyond your fondest dreams, in a New Freedom Gas Kitchen, and a house heated and air-conditioned by gas! The Hartford Gas Co. says: Buy bonds today—to have this all-gas home tomorrow!"

Gas Restoration In Wartorn Italy

● Sixteen gas plants in liberated Italy have resumed operation in recent months, and nine other plants will commence production as soon as additional imported coal becomes available, the Allied Commission reported March 25.

Gas plants suffered less damage from war causes than electric generating plants. The gas works in Naples, however, was heavily damaged, having been systematically mined before the Germans evacuated as well as pattern-bombed by Allied air forces. Service was resumed in certain sections of Naples within three months of its liberation and service there now is about 80 per cent of normal.

Lack of fuel is the principal reason why total gas production in liberated Italy is only slightly more than one third of the pre-war rate. Only about 15 per cent of Italian lignite or Sardinian coal can be used as fuel in the manufacture of gas. Gas coal must be imported, and supplies now come from India, England or the United States, according to the Public Works and Utilities Subcommission of A.C.

The gas system at Florence was also severely damaged, but partial service was begun February 18 as a result of an emergency construction program. Gas produced in Florence is a combination of natural gas piped from the Pietramala fields, which are approximately midway between Florence and Bologna to the north, and manufactured gas, made with olive husks, lignite and imported coal.

The gas plant at Rome produces almost as much gas as all the other 49 gas plants in liberated Italy. In normal times the Rome plant consumed 600 tons of coal a day. Recently its allotment was increased from 150 to 300 tons. Before Allied entrance of Rome the heat content of the gas was reduced in two stages and three reductions were made in the number of hours a day when gas could be burned. Finally gas production was stopped in March, 1944. The Allies entered Rome June 5 and were able to import sufficient coal so that the Rome system could resume gas production in September. Gas is now available in Rome 24 hours a day, although its use is rationed.

Gas works in liberated Italy are now getting a total of about 530 tons of coal a day. While the overriding difficulty of stepping up this import to the 1,500 ton-a-day prewar rate is ocean shipping, internal transportation is also a serious problem. Italian coal cars or wagons will carry at most 20 tons, with the average running closer to 15, so that more than 30 coal cars a day are necessary to haul enough coal for the Rome gas plant. In the United States coal cars carry a maximum of 120 tons each.

Reduced consumption and therefore greatly reduced revenues from gas sales, together with increased operating costs, has necessitated increases in gas rates charged. Temporary surcharges have been permitted in several instances. The surcharge in Naples is 500 per cent, while in Rome it is 425 and in Florence 600 per cent.

The Wonder Flame Is on the Air

Why one large company launched a popular new radio program which adopts the gas industry's national advertising slogan and prepares way for postwar sales

Roger A. Gordon

BY ROGER A. GORDON

Sales Manager, Washington Gas Light Company, Washington, D. C.

THERE was never a greater need for advertising the basic advantages of gas service than today. In putting *The Wonder Flame* on the air, our company is helping to meet that primary need.

This radio adaptation of the gas industry's new slogan arose out of a careful study of our present requirements. It was apparent that general institutional advertising—keeping our name favorably before the public—was not enough to insure an adequate public demand for our product and services when appliance sales were once more resumed.

Having of course little equipment to sell, there was nothing tangible to advertise. And we could not anticipate the specific appliances of the future, even if good taste and good judgment dictated the present use of advertising dealing with them.

We concluded there was one thing we could do effectively. That was to advertise the superiority of gas—to implant the seeds of future buying desire by creating a preference for the inimitable service that gas can render. It was the concensus here that only by laying such a foundation of public demand could we hope to withstand the full force of fuel competition in coming years.

Long regarded as a potent influence in the field of public relations, radio had been assigned considerable prominence in our postwar plans for promotional advertising. This medium was selected as the principle tool for our immediate spade work.

Once having defined our objective—to cultivate the future market through the present use of radio, the problem was to find a proper vehicle. What kind of radio activity would accomplish the utmost toward attaining that objective?

Before seeking the answer to that question we further analyzed the objective. It was apparent that, so far as it concerned the public, we had two jobs to do: First, stimulate a demand for gas service which would result in maximum future gas sales through load retention, expansion and acquisition; second, maintain and extend the prestige of our company while so doing. Further, it was highly desirable that serious consideration be given to our dealer relations. We needed a program which could be interpreted to our local allies as a direct aid in their own future appliance business—one more reason why they should cast their lot with the forward-moving gas industry.

In arriving at an acceptable program, we used an approach which we hoped would rule out as far as practicable the hazards of trial and error. That approach was simply setting up our own specifications for a radio program and then attempting to meet them as closely as possible.

This immediately freed us from the need of appraising ready-made programs offered over the counter. It eliminated the pressure for a quick decision which usually accompanies the better program and station availabilities. It permitted us to establish and adhere to our own policy of what was appropriate instead of having to adapt our policy to a situation not of our making.

The first question to decide was *whom did we want to reach?* The answer to that was: the entire family group. The answer to the second ques-

Cast of "The Wonder Flame"—In center are vocal stars Robert Nicholson and Bernice Rickman

tion: *what time of day* did we want? was obviously: evening time. The next question was *what type of program* did we want? The answer was that we wanted to reach great numbers of people, and we knew to get such an audience we had to *give* them something—something they *wanted* to hear. We were not content to hold a small loyal following with a program well related to our business, but not of interest to the general public.

The temptation of News Commentary was strong, because of the high rating it now enjoys. But news was already well covered in Washington, and there was also a question as to its relative pulling power postwar. We were planning for the future.

Live talent variety entertainment—of a high order—is what finally recommended itself. So our plan was to construct a program which would combine the proven experience of others with carefully worked out innovations, especially designed for telling our story. We were prepared to take as long as necessary to develop the program, locate acceptable talent and then wait for the desired time to open on a representative station.

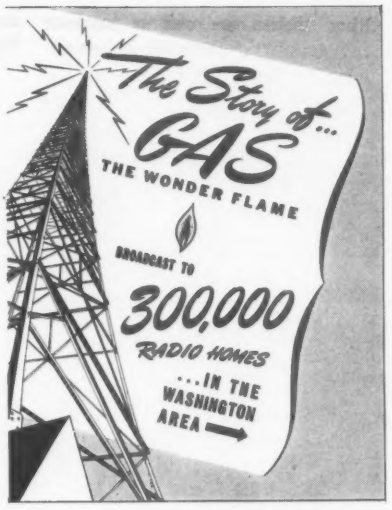
At its own request, we permitted a local advertising agency—one specializing in radio—to design for our approval a program embodying the principles we had arrived at. Members of the agency staff spent some days discussing with us the problems of our business—and then went to work.

Shortly after the program format was established and agreed upon, the right talent and station time became available, and *The Wonder Flame* was launched as a weekly half-hour evening feature over WMAL, Washington's key station of the Blue Network.

This radio offering is basically a diversified entertainment program consisting of musical and dramatic elements. The name of the program, aimed to suggest the superiority of gas service each time it is heard, leaves no doubt as to the sponsor's identity. A special theme, the program's own quartet and other units of the show bear the program name, helping to further establish it with the listening audience.

Billed as a "full half-hour of melody and story," the show is entirely devoid of conventional "commercials." Opportunity for the sponsor's message is provided in narrations by the Voice of the Wonder Flame, who discourses imaginatively on a variety of interesting topics into which are skillfully woven some promotional story of gas service.

There appears to be unlimited source material for narrations, and seemingly



Broadside swells the growing radio audience

the most unrelated subject can usually be used to point up one or more advantages of gas service. Scientific discovery, chapters in natural history, stories of war and peace, glimpses of technical progress, biography and adventure, nutrition and health, the world of today—all provide dramatic copy for the *Voice* and a lead to some promotional reference. For example, the Discovery of Penicillin involved the research laboratory and the Bunsen burners—with obvious progression to modern gas appliances.

Bill enclosure announcing the radio feature

Truck posters, newspaper ads, displays, and letters broadcast news of the gas program

Other themes are used to introduce some specific attribute of gas service, including of course speed, dependability, flexibility, precision and cleanliness.

But *variety* is the program key-note, and music predominates. Two vocalists, a popular quartet and a locally famous 12-piece orchestra are featured regularly. As opportunity permits, the cast is frequently augmented or substitutions made—sometimes performers who might be playing an engagement in Washington can be recruited.

For the basic pattern of this show, it was decided to maintain certain broad uniform outlines, within which variation could be introduced through change of pace, rearrangement of elements and other devices. It is standard practice for musical numbers to be played and sung uninterruptedly in two groupings, no titles being announced. The narrative or dramatic part of the program is inserted between the two musical sequences.

The public service phase of the program is summarized in the final announcement, of which this specimen is typical:

Your hosts, the Washington Gas Light Company and their affiliated companies in nearby Maryland and Virginia, are glad to have had you with us this evening, and invite you to listen in every Thursday at this time for The Wonder Flame . . . presenting Bernice Rickman, Robert Nicholson, The Wonder Flame Quartet and Sidney and his Orchestra. Next week as our special guests we will present the male chorus from the Army Air Forces production, "Winged Victory." . . . Meanwhile, may you continue to enjoy in your own homes the Wonder Flame —gas—which cools as well as heats . . . while you look with us to a brighter future for which your Gas Company and the vast American Gas industry works constantly through research.

The new program has been widely publicized by bill enclosures, displays, radio spots, newspaper ads and truck posters. In addition, broadsides and a series of informative letters have been prepared for plumbers, dealers, builders and other allies.

While it is too early to predict ultimate results, the initial comment has been encouraging. Adequately supplemented with other advertising efforts, this program promises to become of incalculable value as a means of insuring the future of our gas business.

Employee Report Mirrors War Effect

THE annual report to employees by Consolidated Edison Company of New York, Inc., which was released April 6 shows the effect of the war on one of the largest employee groups in metropolitan New York area.

From the start of the war, 65 employees have given their lives in the service of their country.

On December 31, 1944 the Consolidated Edison System Companies had 23,544 active employees, a decrease of 5 per cent during the year. A total of 3,903 employees was absent on military leave and 90 on merchant marine leave. There were also 2,030 on wartime leave, working in war industries utilizing, in many cases, the special skills learned on their jobs with the companies. Of the employees on military leave, 38 were women; of those on wartime leave, 68 were women.

The active employees at the end of the year were divided between 20,417 men and 3,127 women. The average age of all active employees was 45.4 years. One year ago it was 43.9 years, and five years ago (1940) it was 39.6 years, indicating the lack in the ranks of the younger generation as a result of the war.

The average length of service of Edison System employees is 19.2 years, and 71.4 per cent of the employees now at work are more than 40 years old. Five years ago this percentage was only 45.2, another indication of the effect of the war. A total of 18,799 employees, or 80 per cent, has been with the companies more than 15 years.

From the start of mobilization to the end of 1944, a total of 4,676 employees of the Edison System Companies entered military service. Of this number, 707 have returned following discharge for physical, age or other reasons, 576 to jobs with the companies, 130 to ask for and receive wartime leaves, and one to join the merchant marine.

In the foreword to the report it is pointed out that the Consolidated Edison System Companies "carried along the regular service to customers, and in addition handled a heavy war load."

Total wages, salaries and pensions paid to employees of these companies in 1944 amounted to $72,479,000. A chart in the report shows that the average weekly pay (including overtime) of employees increased from $47.32 in 1943 to $52.09 in 1944. During the ten-year period from 1935 to 1944, average weekly pay increased more than 65 per cent.

Total taxes of the companies for 1944 were equal to more than $2,700 per active employee.

Modern Gas Appliance Laboratory Opens

New gas appliance laboratory of the Southern California Gas Company, Los Angeles, which was the scene of an "open house" party March 19 to celebrate its completion. It consists of a large testing room, chemical laboratory, special test kitchen, rooms for making special tests, offices and storerooms. Ample room for postwar growth is provided. Staff of the laboratory, one of the most complete and modern in the country, consists of eight people headed by Harry L. Warren, supervisor. It is a unit of the research department headed by Guy Corfield

Stills

● "Please change my burner. A bomb bompt it."

"I've waited three weeks—and don't tell me there is a war on, I know."

"14 lb. of Armonium, please."

—Impetus in London *Gas Times.*

The author interviewing Peter T. Riley after his honorable discharge from the Navy

Veterans' Re-employment

A clear-cut program which clarifies the company's responsibilities to returning servicemen and maps steps to meet them

BY RANSFORD M. BEACH

Veterans' Reemployment Counsellor, Philadelphia Electric Company

Contributed by

PERSONNEL COMMITTEE

GORDON M. PETERSON, *Chairman*

SOME time ago when the first few employees of the Philadelphia Electric Company serving with the Armed Forces were released and began to resume their former civilian jobs, to return them to the payroll without any misunderstanding was a very easy matter.

As the number of such cases increased slightly, it became evident that some general procedure was necessary, not only as a guide to the supervisory personnel, but also to clarify the company's position on reemployment in the minds of those still on active duty. In spite of all of the publicity given to Section 8 of the Selective Service and Training Act of 1940, there has been considerable misunderstanding among the supervisors and foremen regarding the company's responsibilities to the men in service. Similarly, a number of servicemen had a doubt as to their own status with respect to their reemployment.

Two cases may illustrate the point:

One supervisor put a former employee to work immediately on his return from the Army, without having seen his discharge papers or having him take the usual medical check-up. This naturally resulted in confusion and a seeming "run-around" to the man when the necessary steps were completed after he had started to work.

The other case in point was where one of our discharged men had decided he did not wish to return to his former position and did not report to the company, not realizing that we might have been able to transfer him to a position more to his liking.

Other cases might be cited, but it was clearly recognized that some uniform policy must be established.

The result was the publication of a booklet, describing the company's policy on the reemployment of company veterans, which has been distributed not only to all men and women in the Armed Forces and Merchant Marine but also to all employees.

Under this policy it is the company's objective—

(1) To provide, promptly, a job for every qualified, physically fit Philadelphia Electric Company veteran.

(2) To help company veterans who are physically or otherwise handicapped to fit themselves for a job.

Every former Philadelphia Electric Company employee honorably discharged from the Services, including the Merchant Marine, who was employed on or before May 1, 1940, or after that date, on other than a temporary basis, who makes application within 90 days after discharge from the Services, or from hospitalization continuing after discharge for a period of not more than one year, will be given:

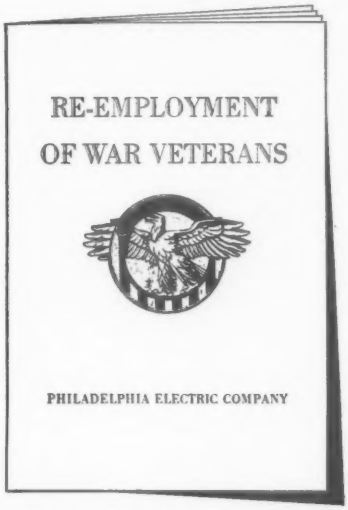
(1) his former position or if this is not possible

(2) a position of like seniority, status and pay at his former working location; or if this is not possible

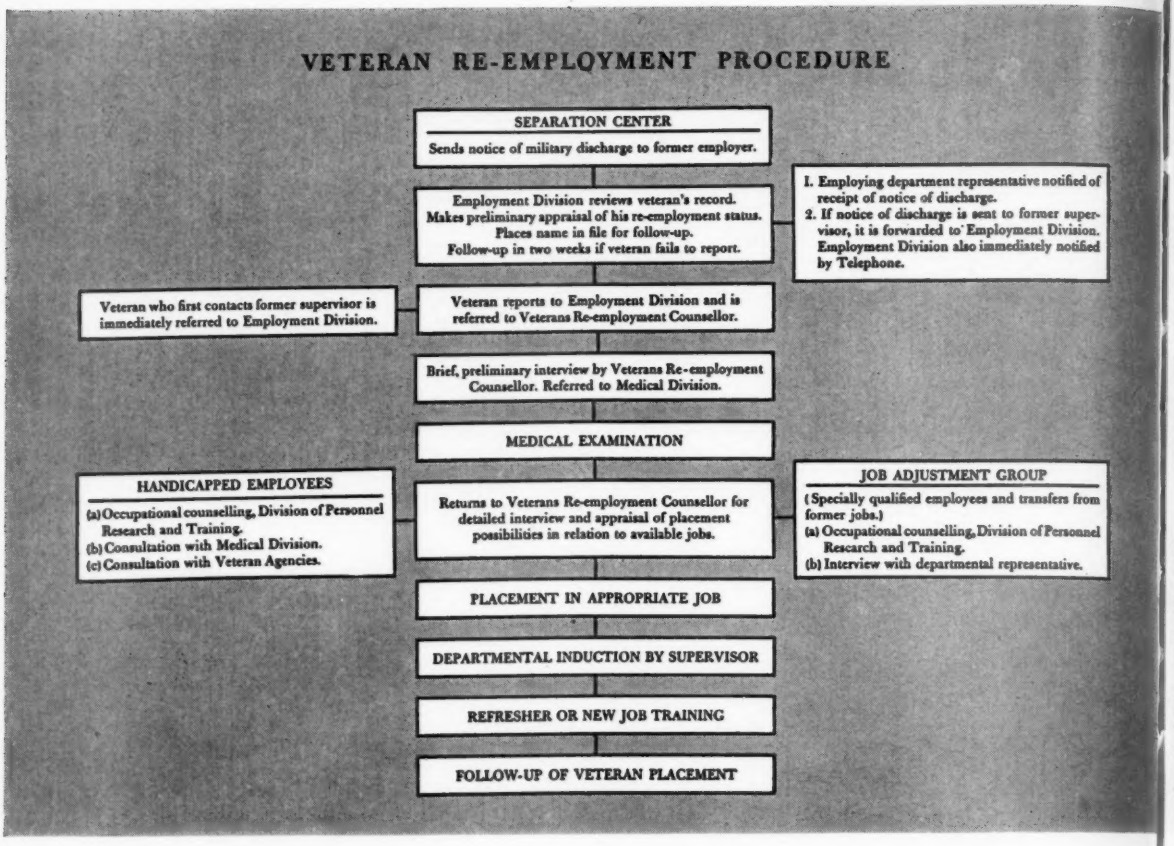
(3) some other available position for which his length of service, experience and ability qualify him at the location where he formerly worked; or if this is not possible

(4) a position for which he is qualified, at some other company location.

If the veteran is physically or otherwise handicapped and cannot qualify immediately for employment, every effort will be made, through the company and outside agencies, to provide vocational rehabilitation.



Booklet describing the company's policies. Copies are available to other gas utilities



The company has already made a survey in each department to determine which jobs will be available.

The Services have set up Separation Centers to facilitate the return of veterans to civilian life. At the time the veteran reports to such a Separation Center a notice of discharge is to be sent to his former employer. When a notice of discharge is received by the Employment Division, the Veterans' Reemployment Counsellor reviews the employment record of the veteran, as well as his military record, in consultation with the appropriate department. Insofar as possible, everything will be in readiness for the prompt placement on the job of the veteran when he actually reports to the Employment Division. If a veteran fails to report to the company within two weeks after the notice of discharge is received, a letter is sent to the veteran's last known home address, advising him of the company's reemployment policy and urging him to communicate with the Employment Division immediately.

When the veteran reports to the Employment Division, he is greeted by the Veterans' Reemployment Counsellor, and after a preliminary interview, is referred to the Medical Division to determine whether or not he can safely return to his former position or whether any physical limitations should be placed on his employment to prevent him from overtaxing his physical capacities.

After the results of the medical examination are known, the Veterans' Reemployment Counsellor, in a more detailed interview with the veteran, will determine whether or not he returns to his former position. He may be considered for transfer because of additional qualifications acquired in the Armed Forces. In general, however, such veterans may find it necessary to reenter the company at the levels at which they left.

In cases of transfer as a result of additional skills acquired during military training or because of a handicapped condition, the facilities of the Division of Personnel Research and Training will be utilized in arriving at a suitable job placement.

After a veteran returns to his old job or is transferred to a new one, both "basic" and "refresher" training will be carried out on the job.

Immediately upon reinstatement as an employee the veteran will be credited with accumulated employment service as though he had been working for the company every day of his military leave, will be entitled to such a vacation as provided for by the company regulations, and if he was a member of the Beneficial Association, he will be restored to membership upon application.

While all of this seems to be a rather complicated procedure, actually, any type of plan can work very smoothly in most cases, particularly if we remember that the returning veteran is one of our fellow employees who is just as happy to return as we are to have him back.

Performance Of Vented Gas Ranges

A new approach to the problem of venting gives valuable information on characteristics of representative gas ranges

Research studies show that normal variations in chimney drafts do not adversely affect performance of properly vented domestic gas ranges not installed flush-to-wall. They also indicate that contemporary draft relief devices permit satisfactory oven and broiler performance of flush-to-wall types but are inadequate to do so in the case of cooking top sections.

Two general methods of venting which will insure good performance of all sections are presented. An application of one of these methods is discussed and advantages offered by its use outlined.

BY K. R. KNAPP

Chief Engineer, American Gas Association Testing Laboratories

A VERY large percentage of domestic gas ranges are installed and operated without connection to a flue or chimney. Experience of millions of gas consumers over many years has conclusively shown that flue connections are not required for their safe and satisfactory performance. Installation of ranges without venting has accordingly become standard practice. Instances nevertheless present themselves where for various reasons venting becomes desirable, as for example, in the interest of securing cooler kitchens in warm weather by the discharge of hot products of combustion into a chimney rather than directly into the room.

In the aggregate such cases are sufficiently numerous to make it a matter of importance that consumers be assured of proper performance of their vented ranges under all draft conditions that may ordinarily be encountered. These include excessive updrafts and downdrafts, as well as complete flue stoppage. All may readily be met by approved gas ranges.

Under present gas range approval standards a relief opening in the flue outlet connection is required to provide protection against abnormal drafts. When properly designed, these relief openings have been found to provide satisfactory performance under very extreme draft conditions except where ranges of the flush-to-wall type are concerned. Installation of such ranges presents an additional problem as it becomes necessary to dispose of the flue gases discharged from the relief openings when downdrafts or flue stoppages occur. Common practice is to provide passages beneath the range through which these gases may be directed toward the front. Under this arrangement, however, they may mingle with the air supply for the top burners and thus cause poor combustion and lighting difficulties. Furthermore, both oven and broiler combustion may be impaired under conditions of flue stoppages when a range is installed close to the wall and when oven and broiler doors are tightly fitted.

Additional problems are also presented in the proper venting of a flush-to-wall range due to the limited space available and the proximity to combustible walls which may result from use of a conventional flue. Development of designs which would lend themselves to application to the usual flush-to-wall type of range and also permit ready installation of a vent connection would therefore fill a very definite need.

Numerous tests were conducted on a number of representative modern ranges including several of the flush-to-wall type to determine their performance under extreme conditions of updraft and downdraft, as well as complete flue stoppage. In order to make test conditions as severe as possible, all flush-to-wall models were sealed tightly to the wall in all cases. Results showed clearly that designs of flue outlets commonly employed possess inherent limitations which prevented them from functioning in a satisfactory manner under the extreme conditions imposed. Therefore,

Fig. 1. Test arrangement for applying chimney drafts to special type of gas range flue outlet

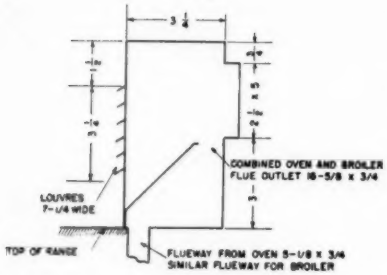


Fig. 2. Cross-section of special draft diverting device located in splash back

a departure from conventional methods was indicated to secure the basic objective desired, namely, to prevent mixing of air supply for the section with combustion products from the oven and broiler.

Analysis revealed 2 possibilities for accomplishing the purpose desired. These were (1) provision of an individual air supply for the top section in connection with conventional methods of venting and, (2) positioning of the draft diverting device, including its relief opening, in the splash-back above the cooking top.

A simple way of providing air supply for the top burners is by means of openings in the front panel. If, however, an oven or broiler is located beneath the cooking top, its door must be fitted tightly to prevent leakage of combustion products which may enter the burner box through the front panel openings and interfere with combustion. Another method is to employ a separate air duct leading from the burner box to the base and thence to the front of the range.

When either method is used together with a conventional oven or broiler flue outlet design, it is essential that an additional relief opening be supplied in the splash-back communicating with the space behind the range where draft diverter relief openings are located. Unless this is done, poor combustion or possible outage of burners may take place under a condition of blocked flue if the range is fitted snugly to the wall and the doors are reasonably tight. On one range studied, relief openings at the base, such as might be created by raising the range a few inches from the floor, were found ineffective in preventing incomplete combustion. However, this condition was corrected by providing an additional relief opening at the top of the splash-back.

After considerable experimental work a method of venting was developed which employed a draft diverting device placed in the splash-back above the cooking top. It is illustrated in Fig. 1. Its method of operation may be readily understood by reference to a cross-sectional view given in Fig. 2. This particular design only appeared to be suitable for inclusion in the splash-back with a rear flue connection. It will be seen that no change takes place in direction of the downdraft air stream after passing the combined flue outlet from the oven and broiler. This has been found to represent a fundamental factor in draft diverter design as any change in direction of air flow beyond the appliance flue outlet, regardless of the contour of the diverter, will result in a positive pressure against the exit of flue gases.

This device was mounted on a flush-to-wall type range with a high broiler. Oven and broiler combustion was satisfactory under all adverse draft conditions imposed. Performance of the top burners was likewise satisfactory, no interference resulting from simultaneous operation of oven and broiler burners. Oven maintaining rates increased only slightly under updrafts. It was possible to effect satisfactory automatic lighting of the top burners under all draft conditions. No spillage from the relief openings occurred with 6 ft. of vertical stack mounted on the flue outlet of the range. As the body of the range was sealed to the wall at the back and the oven and broiler doors were likewise sealed, this performance was all the more noteworthy.

Other advantages may also be obtained by locating the venting device in the splash-back. Under normal conditions of updraft some of the cooking odors and heat from the top may be removed. Location of a flue outlet above the range top also lends itself to standardized flue outlet connections particularly as regards height above the floor. This fact appears worthy of special attention when concealed flue connections are desired, and, indeed, whenever it is desired to vent ranges of the flush-to-wall type. Their increasingly wide acceptance has made availability of ready means of venting a matter worthy of special attention.

A complete discussion of the performance of contemporary ranges studied in this investigation is presented in Research Bulletin No. 27, Study of Performance Characteristics of Vented Domestic Gas Ranges. This was published in August, 1944, as the 7th bulletin in the domestic gas cooking research project sponsored by the Committee on Domestic Gas Research. Its study is recommended to all engineers desiring to embody the recommendations presented in their designs.

Dream Line

● Assembly-line technique has hit the nation's gas pipe lines. Describing the building of the new La Goleta-Los Angeles natural gas pipe line in the April 12 *Public Utilities Fortnightly*, James H. Collins says:

"It was built on an assembly line, a mile every thirty-six hours, and is a solid welded string from end to end, 105 miles long, spanning ravines by a new type of "catenary" suspension. And it operates at 1,000 pounds' pressure, twice ordinary pressures, highest in the country.

"Moreover, it is reversible. During the winter months it draws gas from the unique La Goleta underground reservoir northwest of Santa Barbara. In summer, it will draw in surplus gas from many oil fields to build up the reserve.

"The La Goleta reservoir is a gas engineer's dream in every way except location. It is tight against leaks, so that gas put down into its depth will come out again, not be lost. It is so ample that, where 2,000,000,000-cubic feet capacity was spoken of at its inception, today it holds fully 10,000,000,000 feet and apparently has room for more."

Marriages

● The marriage boom which started with the draft in 1940 and reached its peak two years later, is now gathering momentum in a downhill dip which is not likely to stop until V-E day. So says the Jewelers' Circular-Keystone upon completion of its 16th annual marriage survey appearing in the March issue.

A poll of marriage license bureaus in the 50 largest cities in the country showed a drop in 1944 of 9.2 per cent from the 1943 rate. The magazine estimates that the overall total in marriages during 1944 reached approximately 1,500,000. The downward trend can clearly be seen when this figure is compared with 1,758,000 marriages in 1942.

Economics of Gas House Heating

Fundamental factors to be considered when analyzing the heating load and data on the selection of the most economical gas production methods for supplying it

The following study, being presented in the A. G. A. MONTHLY in four parts, covers certain fundamental factors which should be considered in a study of the Economics of Heating and the selection of the most economical gas production methods for supplying the heating load.

Part I, which appeared in April, dealt with the development of a simple formula for the determination of the overall unit cost per M.C.F. of making gas for different load factor conditions. This formula enables a quick determination of that "load factor" at which one gas process is more economical than another.

Part II presents a comprehensive analysis of the load characteristics of the heating load. This study brings out the relation of the annual load to certain segments of the daily peaks. A basis for determining the load factor at different segments of the peaks is given. Case studies for several sections of the country are included.

Part III gives an application study of the formula developed in Part I and the load characteristics of Part II. This study shows how to apply the data developed in Part I and II.

Part IV. In this section a few typical gas companies are used to show the application of the fundamental factors (previously developed and discussed) to actual company conditions. The investments for the most economical processes are developed for 10% saturation of house heating. This part of the report advances the study another step in the overall consideration of the economics of heating.

BY HALL M. HENRY*

Director of Gas Operations, Negea Service Corp., Cambridge, Mass.

PART II

Hall M. Henry

FOR a proper consideration of the relative economics of different methods of making gas for peak load purposes, it is necessary that we have a thorough knowledge of the nature and character of the heating load. To obtain a picture of this, a study of the degree-days by days for the past 14 heating seasons has been analyzed for a number of companies. The results of these studies are set forth in the accompanying tables and curves.

The data cover companies in New England, New York, Indiana, New Jersey and Maryland. Companies in these areas were selected to give an indication of the changes in characteristics of the peaks that might develop from heating loads for different intensities of weather conditions.

This study is being presented as a guide to the development of certain fundamental factors which seem necessary for a proper appraisal of different gas manufacturing processes and fuels for the most economical production of gas for heating purposes. It will be necessary for each company to develop and use factors suitable to its own situation. It is believed that such factors, when used in conjunction with the formula developed and presented under Part I of this report, will be helpful in indicating the most economical selection of gas making processes and fuels for peak loads of heating.

Purpose: The purpose of this analysis has been to determine the characteristics of the heating load using degree days rather than gas consumptions. In assembling the data we have approached the problem from the viewpoint that the overall operating cost of gas to supply all or part of the heating load is greatly influenced by the *number of days' use per year* that is made up of the plant daily gas manufacturing capacity.

Our object therefore has been to determine the number of days per year that a plant's daily capacity would be used under the following conditions:

1. If the daily gas manufacturing capacity is such as to handle the maximum total daily demand. (See Definition 1.)
2. If the daily gas manufacturing capacity were designed to handle a segment of the daily demand. (See Definition 2.)
3. If the daily gas manufacturing capacity were designed to handle a peak block of the maximum total daily demand. (See Definition 3.)
4. If the daily gas manufacturing ca-

Company: _____

Month: _____

TABLE 1

DEGREE-DAYS ABOVE 30 D.D.

Day	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
1																
2																
3																
4																
5																
6																
7																
8																
9																
29																
30																
31																
No. of Days																
Total Degree-Days																
D.D's up to 30*																
D.D's over 30																

* Multiply No. of Days by 30 to get this figure for each month and year.

*Chairman, Market and Economic Research Group of the American Gas Association's Committee on Postwar Planning.

TABLE 2

Heating Season	COMPANY A: No. of Days with D. Ds. Above 46	COMPANY A: No. of D. Ds. Above 46 for Days with D. Ds. Above 46	COMPANY A: Seasonal Degree Days	COMPANY A: Current Season	COMPANY A: 10 Year Average Season 6801.4	COMPANY B: No. of Days with D. Ds. Above 43	COMPANY B: No. of D. Ds. Above 43 for Days with D. Ds. Above 43	COMPANY B: Seasonal Degree Days	COMPANY B: Current Season	COMPANY B: 10 Year Average Season 5946	COMPANY C: No. of Days with D. Ds. Above 40	COMPANY C: No. of D. Ds. Above 40 for Days with D. Ds. Above 40	COMPANY C: Seasonal Degree Days	COMPANY C: Current Season	COMPANY C: 10 Year Average Season 5948
	Per Cent Degree Days Above 46 for Days With Degree Days Above 46 Are To:					Per Cent Degree Days Above 43 for Days With Degree Days Above 43 Are To:					Per Cent Degree Days Above 40 for Days With Degree Days Above 40 Are To:				
1930–31	13	53.0	6392.0	0.9	0.8	11	50	5260	1.0	0.8	19	120.0	5768	2.1	2.0
1931–32	8	23.0	6159.7	0.4	0.3	5	11	4696	0.3	0.2	6	20.0	5163	0.4	0.3
1932–33	15	83.0	6745.5	1.2	1.2	9	47	5180	0.9	0.8	11	49.0	5037	1.0	0.8
1933–34	38	374.0	7488.6	4.9	5.4	38	325	6313	5.2	5.4	31	237.0	5995	4.0	4.0
1934–35	33	243.0	7069.0	3.4	3.6	34	237	6324	3.8	4.0	33	248.0	6356	3.9	4.0
1935–36	42	231.0	7094.9	3.4	3.6	35	177	6101	2.9	3.1	39	240.0	6213	3.9	4.0
1936–37	6	18.0	6616.1	0.3	0.2	4	9	5671	0.1	0.2	12	28.0	5778	0.5	0.4
1937–38	18	66.0	6822.2	1.1	1.1	14	57	5902	1.0	1.0	19	73.0	5845	1.2	1.2
1938–39	16	67.0	6810.3	0.9	0.9	10	46	5779	0.8	0.8	13	52.0	5531	0.9	0.9
1939–40	29	118.0	7429.5	1.6	1.7	13	55	6375	0.9	0.9	42	213.0	6516	3.3	3.6
1940–41	16	81.0	6935.3	1.1	1.2	33	129	5989	2.1	2.0	16	69.0	5964	1.1	1.1
1941–42	19	122.0	6296.8	1.9	1.7	20	118	5447	2.2	2.2	18	76.0	4736	1.5	1.3
1942–43	26	236.0	7215.0	3.2	3.4	23	196	6097	3.2	3.3	25	182.0	5850	3.2	3.0
1943–44	21	136.0	7087.1	1.9	2.0	16	87	5962	1.4	1.4	21	118.0	5723	2.0	1.9
Average	21.4	132.2	6866	2.0%	2.0%	19	110	5792	1.8%	1.8%	21.8	123.2	5743	2.2%	2.0%

Heating Season	COMPANY F: No. of Days with D. Ds. Above 40	COMPANY F: No. of D. Ds. Above 40 for Days with D. Ds. Above 40	COMPANY F: Seasonal Degree Days	COMPANY F: Current Season	COMPANY F: 10 Year Average Season 5948	COMPANY G: No. of Days with D. Ds. Above 40	COMPANY G: No. of D. Ds. Above 40 for Days with D. Ds. Above 40	COMPANY G: Seasonal Degree Days	COMPANY G: Current Season	COMPANY G: 10 Year Average Season 5948	COMPANY H: No. of Days with D. Ds. Above 40	COMPANY H: No. of D. Ds. Above 40 for Days with D. Ds. Above 40	COMPANY H: Seasonal Degree Days	COMPANY H: Current Season	COMPANY H: 10 Year Average Season 5948
1930–31	10	36	5146	0.70	0.7	15	107	5340	2.0	2.0	9	34	4346	0.8	0.8
1931–32	4	14	4423	0.30	0.3	11	75	4474	1.7	1.4	6	22	3459	0.6	0.4
1932–33	14	61	4886	1.24	1.0	18	162	5234	3.1	3.1	12	59	4072	1.4	1.3
1933–34	36	312	5787	5.3	5.4	23	157	5487	2.8	3.0	39	264	4784	5.5	5.8
1934–35	23	168	5332	3.2	2.8	16	116	5112	2.3	2.2	20	142	4375	2.3	2.9
1935–36	41	293	5506	5.3	4.9	40	528	6104	8.7	10.0	40	291	4751	6.1	6.4
1936–37	3	8	4966	0.2	0.1	9	44	5436	0.8	0.8	6	14	4143	0.3	0.3
1937–38	12	40	5077	0.8	0.7	20	114	5299	2.1	2.1	12	35	4186	0.8	0.8
1938–39	13	39	4986	0.8	0.6	10	34	4848	0.6	0.6	8	29	4044	0.7	0.6
1939–40	30	130	5787	2.2	2.2	29	283	5831	4.8	5.3	30	152	4838	3.1	3.3
1940–41	10	22	5331	0.4	0.4	15	95	5119	0.2	0.2	10	25	4396	0.5	0.5
1941–42	18	93	4721	2.0	1.5	22	136	4795	2.8	2.5	12	85	3313	2.2	1.8
1942–43	21	139	5354	2.6	2.3	30	239	5657	4.2	4.5	22	112	4412	2.5	2.5
1943–44	12	49	5349	0.9	0.9	19	111	5426	2.0	2.1	15	59	4451	1.3	1.3
Total	249	1404	72659	.....	.....	277	2201	74155	.....	.....	241	1325	60070	.....	.....
Average	17.8	100.3	5189	2.0%	1.9%	19.8	157	5297	3.0%	3.0%	17.2	91.6	4291	2.2%	2.1%

OTHER DATA:	Company A	Company B	Company C	Company F	Company G	Company H
Largest Degree Day past 14 Seasons	78	73	66	79	74	62
Largest Consecutive 3 Day Average Degree Day Day (14 Seasons)	66	63	59	63	65	53
Maximum 10 Year Average Degree Day Day	46	43	40	40.6	42	36
10 Year Degree Days per Season	6801	5946	5748	5261	5362	4319
Normal Seasonal Degree Days	6801	6022	5800	5281	5298	4533

TABLE 3

VALUE OF L PER ONE DEGREE-DAY SEGMENT OR NUMBER OF DAYS WITH DEGREE-DAYS OVER (CO.: WORCESTER)

Daily D. D.'s...	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1930–31.....	99	88	80	74	68	59	56	49	36	31	28	27	25	23	20	14	13	8	6
1931–32.....	90	87	81	71	59	48	42	40	36	33	30	22	17	17	13	11	8	6	5
1932–33.....	89	82	70	58	52	48	40	36	33	32	27	25	24	21	18	16	15	14	11
1933–34.....	116	107	99	95	87	80	73	69	64	59	55	54	53	48	43	41	38	35	33
1934–35.....	94	91	90	83	76	71	67	61	57	53	47	46	42	38	37	36	33	32	29
1935–36.....	96	92	89	81	78	77	70	64	63	57	52	51	46	45	45	44	42	37	36
1936–37.....	97	89	85	83	70	67	58	48	39	32	31	27	22	19	17	10	6	6	2
1937–38.....	95	91	85	78	72	69	63	56	50	46	37	33	32	28	25	23	18	14	7
1938–39.....	102	99	92	88	83	80	70	65	59	55	49	43	38	37	28	23	16	11	10
1939–40.....	118	114	103	97	88	80	77	72	66	61	58	54	49	46	38	31	29	24	20
1940–41.....	106	104	100	91	87	82	76	67	60	56	49	42	36	26	22	16	16	12	12
1941–42.....	83	78	73	64	58	54	51	46	41	37	35	32	31	27	23	21	19	15	14
1942–43.....	107	103	100	95	88	81	73	70	64	59	48	45	40	38	35	28	26	24	19
1943–44.....	111	102	95	95	82	76	68	64	58	54	49	46	43	35	33	29	21	20	19
Total.....	1403	1327	1242	1153	1048	972	884	807	726	665	595	547	498	448	397	343	300	258	223
(1)*Av.perYr.L.	100.2	94.8	88.7	82.3	74.8	69.4	63.1	57.6	51.8	47.5	42.5	39.0	35.5	32.0	28.3	24.5	21.4	18.4	15.9
Daily D. D.'s...	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
1930–31.....	5	4	4	4	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0
1931–32.....	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1932–33.....	9	9	6	4	4	3	2	1	1	1	1	1	1	0	0	0	0	0	0
1933–34.....	31	28	28	27	20	19	17	14	10	10	10	7	6	6	6	5	4	4	3
1934–35.....	23	20	18	16	14	12	9	9	5	5	5	4	4	2	1	1	1	0	0
1935–36.....	28	21	20	19	10	7	5	2	1	1	1	1	0	0	0	0	0	0	0
1936–37.....	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1937–38.....	7	4	4	4	3	1	1	1	1	1	0	0	0	0	0	0	0	0	0
1938–39.....	7	4	3	3	3	3	2	1	1	1	1	1	0	0	0	0	0	0	0
1939–40.....	12	9	6	5	5	2	2	2	1	1	0	0	0	0	0	0	0	0	0
1940–41.....	8	7	6	5	4	4	2	1	1	1	1	1	0	0	0	0	0	0	0
1941–42.....	13	12	8	8	7	6	5	3	2	2	2	1	1	1	1	0	0	0	0
1942–43.....	17	16	15	13	10	9	9	9	8	8	6	4	4	4	4	4	4	3	3
1943–44.....	15	13	11	9	7	6	5	3	3	2	1	1	1	0	0	0	0	0	0
Total.....	180	149	130	117	90	74	61	47	35	33	28	21	17	13	12	10	9	7	6
(1)*Av.perYr.L.	12.8	10.6	9.2	8.3	6.4	5.2	4.3	3.5	2.5	2.3	2.0	1.5	1.2	.92	.85	.71	.64	.5	.42

(1)* Number of days per year with degree days above those shown at top of each column, or value of L per one degree-day.

pacity were designed to handle a base block of the maximum total daily demand. (See Definition 4.)

Data on the frequency of occurrence of extremely cold days have also been compiled.

Definitions: Certain terms have been selected and defined as they are used in this study:

1. The maximum total daily demand is equal to the largest consecutive 3-day average degree-day day for the past 14 seasons.
2. A segment is 1 degree-day of daily demand.
3. A block is more than 1 degree-day of daily demand.
4. A peak block of the maximum total daily demand is that portion of daily demand which is not a regular season expectation.
5. A base block of the maximum total daily demand is that portion of daily demand which may be expected to occur seasonally.
6. The capital letter L is used to denote the number of days per year that plant daily capacity would be used under different load conditions.

Outline of Procedure and Data Developed

Why degree days rather than gas consumptions can be used to determine value of L: By definition, L is used to denote the number of days per year that plant daily gas manufacturing capacity would be used for certain load conditions. It is now necessary to show why for all practicable purposes the daily degree-days and the corresponding seasonal degree-days can be considered as representing the relative magnitude of the daily gas demands and annual gas loads which will result from heating. For instance, the daily gas heating consumption in any given situation would be determined by multiplying the daily degree-days by the gas consumption per degree-day. If D represents the number of daily degree-days and C the consumption per degree-day, then the daily gas demand would be D x C. Similarly the annual gas consumption would be Da x C (where Da is the annual seasonal degree-days). Now if DC is the daily gas peak demand and DaC the annual gas consumption, then $\frac{DaC}{DC}$ must give the number of days per year a plant of daily capacity DC would operate at capacity DC to produce gas volume DaC. Now, since the C's will cancel out we have $\frac{Da}{D} = L$ or the number of days per year a plant represented by D degree-day would operate at D degree-days capacity to produce Da degree-days of load. Thus it is evident that we can use daily degree-days and annual degree-days to denote the relationship that would exist between annual and daily gas use for various degree-day conditions.[1]

How value of L was determined: Since L or the number of days' use per

[1] As pointed out in Part I, the consumption per degree-day on the maximum degree-day day may be more or less than the consumption per degree-day for the entire seasonal degree-days. Should subsequent data show there is a variation this would be taken care of in the formula developed in Part I, by supplying a factor t to the value of L.

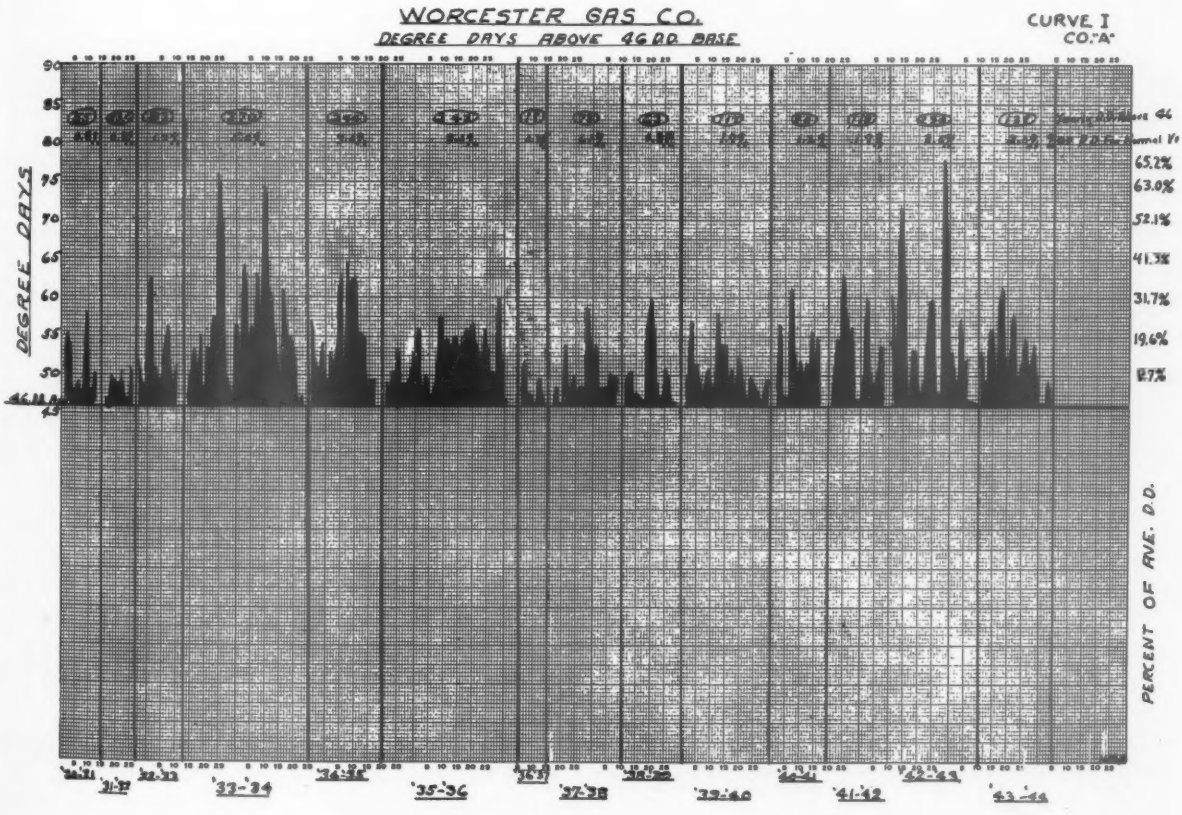


TABLE 4

VALUE OF L PER SEGMENT OF DAILY PEAK

The following table shows the value of L or number of days use per year of plant daily capacity for 1 degree-day segment of daily peak at different degree-day day levels. Data for companies in Massachusetts, New Jersey and Indiana are shown:

DEGREE DAYS PER DAY

	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Company A....	100.2	94.8	88.7	82.3	74.8	69.4	63.1	57.6	51.8	47.5	42.5	39.0	35.5	32.0	28.3	24.5	21.4	18.4	15.9	12.8
Company B....	76.4	67.5	65.3	57.7	54.4	47.0	44.0	37.8	36.2	30.4	29.3	23.5	21.6	17.9	16.7	13.1	11.7	8.7	7.6	5.9
Company C....	72.2	65.3	59.6	52.7	47.4	42.5	37.3	33.6	28.3	25.3	21.8	19.0	16.0	13.4	10.6	9.0	7.5	6.0	4.9	3.9
Company F....	60.6	51.7	49.1	40.9	39.1	33.4	31.6	25.9	24.6	19.2	17.8	12.9	19.9	10.0	9.2	6.9	5.9	4.6	4.0	3.2
Company G....	68.9	60.4	57.6	49.8	47.1	39.9	37.9	32.2	30.6	26.2	24.9	20.7	19.8	17.1	16.3	12.8	11.9	10.4	9.8	8.4

Company A: Worcester, Mass. Company C: New Bedford, Mass.
Company B: Cambridge, Mass. Company F: Trenton, N. J.
Company G: Indianapolis, Ind.

Explanation: Below 30 under degree-days per day and opposite Company A we see 100.2. This means that a plant built for a daily capacity equal to the gas consumption represented by 1 degree-day segment of load (at the 30 degree-day level) would operate at this daily capacity for 100.2 days per year. However at the 40 degree-day level a plant designed for 1 degree-day segment of capacity would only operate 42.5 days per year at the daily capacity.

TABLE 5

VALUE OF L—i.e. THE NUMBER DAYS USE PER YEAR OF PLANT CAPACITY WHEN DESIGNED TO SUPPLY CERTAIN PEAK BLOCKS AND BASE BLOCKS OF MAXIMUM TOTAL DAILY DEMAND

A. Value of L for Certain Peak Blocks

	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Company A.....	29.5	27.5	25.5	23.6	21.8	20.1	18.4	16.9	15.4	14.1	12.8	11.6	10.4	9.0	8.4	7.8	6.6	5.8
Company B.....	21.3	19.6	17.6	16.4	15.0	13.6	12.4	11.1	10.0	8.9	8.0	7.0	6.3	5.5	4.8	4.2	3.7	3.2
Company C.....	20.2	18.4	16.6	15.0	13.5	12.1	10.7	9.5	8.4	7.4	6.5	5.6	4.8	4.1	3.5	3.0	2.6	2.1
Company F.....	14.4	12.9	11.7	10.5	9.4	8.4	7.4	6.5	5.7	4.9	4.3	3.7	3.2	2.7	2.5	2.0	1.7	1.4
Company G.....	18.6	17.1	15.8	14.5	13.4	12.3	11.3	10.4	9.6	8.8	8.1	7.4	6.8	6.2	5.7	5.2	4.8	4.4

B. Value of L for Certain Base Blocks

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Company A.....	191.2	188.3	185.4	182.1	179.5	176.5	173.5	171.9	167.6	164.6	161.7	158.7	155.9	153.1	150.4	147.6	145.0	142.3
Company B.....	177.3	174.0	170.7	167.2	164.3	161.1	158.0	155.1	151.9	148.6	145.9	143.1	140.2	137.5	134.7	132.1	129.3	127.0
Company C.....	173.7	170.4	173.4	163.9	160.6	157.4	154.2	151.0	150.6	144.9	141.9	142.4	136.1	133.3	130.6	127.9	125.3	122.8
Company F.....	160.1	156.9	153.6	150.5	147.2	144.1	141.1	138.1	135.2	132.3	129.5	126.8	124.1	121.5	118.9	116.5	114.1	111.6
Company G.....	154.8	152.0	149.1	146.4	143.6	140.8	138.0	135.3	132.6	129.9	127.3	124.9	122.4	120.0	117.7	115.4	113.2	111.0

Company A: Worcester, Mass. Company C: New Bedford, Mass.
Company B: Cambridge, Mass. Company F: Trenton, N. J.
Company G: Indianapolis, Ind.

Explanation: If we look at the value of L, Table A, for Company A below the 30 degree-day figure we find a value of 29.5. This means that if a plant were designed to supply the peak block of the maximum total daily demand represented by the degree-days between 30 and 66 (the figure 66 is the largest consecutive 3 day average degree-day day during past 14 years for Company A) or for 36 degree-days, the plant would only have to operate 29.5 days at full capacity to produce the volume of gas needed for the seasonal degree-days above 30 for the days with degree-days larger than 30.

On the other hand we see in Table B that a plant designed to supply the base peak for degree-days under 31 would operate 191.2 days per year to produce the volume of gas needed for the seasonal degree-days below 31 for the days with degree-days 30 or less.

TABLE 6

NUMBER OF DEGREE-DAYS PER SEASON CORRESPONDING TO CERTAIN PEAK BLOCKS OF DAILY PEAKS AND THEIR PER CENT OF NORMAL SEASONAL DEGREE-DAYS*

DEGREE DAYS PER DAY

	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Company A																					
Degree-Days per Season.....	1063	963	868	790	697	622	553	490	432	381	330	291	252	216	184	156	131	110	91	76	63
% of Normal Season Degree-Days.....	15.6	14.2	12.8	11.4	10.2	9.1	8.1	7.2	6.3	5.6	4.9	4.2	3.7	3.1	2.7	2.2	1.9	1.6	1.3	1.1	.9
Company B																					
Degree-Days per Season.....	702	626	558	493	435	381	334	281	251	215	185	155	132	110	92	76	63	51	42	35	29
% of Normal Season Degree-Days.....	11.7	10.4	9.3	8.2	7.3	6.3	5.6	4.8	4.2	3.6	3.1	2.6	2.2	1.8	1.5	1.3	1.0	.9	.7	.6	.5
Company C																					
Degree-Days per Season.....	587	515	450	390	338	290	248	210	177	149	123	101	82	66	53	42	33	26	20	15	11
% of Normal Season Degree-Days.....	10.1	8.8	7.7	6.7	5.8	5.0	4.2	3.6	3.0	2.5	2.1	1.7	1.4	1.1	.9	.7	.5	.4	.3	.3	.2
Company F																					
Degree-Days per Season.....	476	416	364	315	274	235	202	170	144	119	100	82	69	56	46	36	30	24	19	15	12
% of Normal Season Degree-Days.....	9.0	7.8	6.8	5.9	5.1	4.4	3.8	3.2	2.7	2.2	1.8	1.5	1.3	1.0	.8	.6	.5	.4	.3	.2	.2
Company G																					
Degree-Days per Season.....	653	584	524	466	416	369	329	292	259	229	203	178	157	137	120	104	91	79	69	59	50
% of Normal Season Degree-Days.....	12.3	11.0	9.8	8.7	7.8	6.9	6.2	5.5	4.8	4.3	3.8	3.3	2.9	2.5	2.2	1.9	1.7	1.4	1.3	1.1	.9

*14-year averages

Company A: Worcester, Mass. Company C: New Bedford, Mass.
Company B: Cambridge, Mass. Company F: Trenton, N. J.
Company G: Indianapolis, Ind.

Significance: The figure 1063 for Company A, Col. 1 directly under 30 is the seasonal degree-days above 30 for days with degree-days larger than 30. This figure of 1063 represents the seasonal degree-days and hence volume of gas which a plant designed for peak block of degree-days above 30 would have to make.

The figure 15.6 per cent in first column under 1063 for Company A shows that these 1063 degree-days are 15.6 per cent of the total normal season degree-days, or a plant designed for the peak block of degree-days above 30 would have to produce 15.6 per cent of the annual heating consumption.

year of daily plant capacity is the key to the determination of the overall cost per M.c.f. of gas, it is necessary that the reader understand how the value of L was determined for the several conditions previously outlined under *Purpose.*

1. *The first value of L will be calculated for No. 1 under "Purpose"* or the number of days' use per year that would be made of plant daily gas manufacturing capacity if the daily gas manufacturing capacity is such as to handle the maximum total daily demand:

Let us use degree-day data for Company A to show this calculation. For this company we have the following:

Normal seasonal degree days 6801 which is the seasonal load to be supplied.

Largest consecutive 3-day average degree-day day 66, which is the maximum total daily demand for which provision must be made.

Therefore $L = \frac{6801}{66} = 103$ days use per year of maximum total daily demand.

Hence to find the number of days' use per year of a plant designed to handle the maximum total daily demand, determine the largest consecutive 3-day average degree-day day (over 14-year period or other appropriate period) and divide into the seasonal degree-days.

2. *How value of L was determined when daily demand is equal to a segment or 1 degree-day.* Later on in this study, use is made of the value of L for a segment of the daily peak demand. It is, therefore, necessary that the reader understand the meaning of the value of L and how derived for a segment of the daily peak. By definition a segment is 1 degree-day, hence a segment of daily peak is that portion of daily peak which would be created by 1 degree-day.

From a study of the degree-day data (season 1931-32) for Company B, the following information was obtained:

Feb.	1	had 45 degree-days
Feb.	15	had 44 degree-days
Feb.	16	had 45 degree-days
Feb.	24	had 46 degree-days
March	15	had 45 degree-days

Now the value of L per segment for the different degree-day levels was obtained as follows:

A. At the 46 degree-day level there is only one day with degree-days of 46 or larger. Thus if a company had a plant which could supply the daily demand up to and including 45 degree-days and wanted to increase its plant capacity to handle the loads on a 46 degree-day day, the increase in plant capacity would be equal to 1 degree-day and this increase in capacity would have been used only 1 day during the heating season. Hence, the value of L per segment at the 46 degree-day level was 1 (for this season 1931-32).

B. Now suppose the plant daily capacity could handle only the load up to and including a 44 degree-day load, and a company wanted to increase the daily capacity equal to 1 degree-day or so that it could take care of all the days with degree-days above 44—to the extent possible with a 1 degree-day of extra plant daily capacity. From the tabulation the following days with degree-days of 45 or larger are listed:

Feb.	1	45
Feb.	16	45
Feb.	24	46
March	15	45

or a total of 4 days. Hence the value of L per segment at the 45 degree-day level is 4. Therefore, the extra plant daily capacity of 1 degree-day would have operated 4 days per year at the 45 degree-day level during 1931-32. Similarly the value of L at the 44 degree-day level is 5.

It is evident from this explanation that the value of L per segment, i.e., 1 degree-day, at any degree-day level is merely the number of days per season with degree-days equal to or greater than the degree-day level for which L is to be determined. Hence to determine the value of L at a 30-degree-day level

TABLE 7

NUMBER OF DEGREE-DAYS PER SEASON CORRESPONDING TO CERTAIN BASE BLOCKS OF DAILY PEAKS AND THEIR PER CENT OF NORMAL SEASONAL DEGREE-DAYS*

DEGREE DAYS PER DAY

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Company A																					
Degree-Days per Season	5738	5838	5933	6011	6104	6179	6248	6311	6369	6420	6471	6510	6549	6585	6617	6645	6670	6691	6710	6725	6738
% of Normal Season Degree-Days	84.3	85.8	87.2	88.4	89.7	90.8	91.9	92.8	93.6	94.4	95.1	95.7	96.3	96.8	97.3	97.7	98.0	98.3	98.6	98.9	99.0
Company B																					
Degree-Days per Season	5320	5394	5464	5529	5587	5641	5688	5741	5771	5807	5837	5867	5890	5912	5930	5946	5959	5971	5980	5987	5993
% of Normal Season Degree-Days	88.3	89.5	90.9	91.8	92.7	93.6	94.4	95.3	95.8	96.4	96.9	97.4	97.8	98.1	98.4	98.7	98.9	99.1	99.3	99.4	99.5
Company C																					
Degree-Days per Season	5213	5285	5350	5410	5462	5510	5552	5590	5623	5651	5677	5699	5718	5734	5747	5758	5767	5774	5780	5785	5789
% of Normal Season Degree-Days	89.8	91.1	92.2	93.2	94.2	95.0	95.7	96.4	96.9	97.4	97.8	98.2	98.6	98.8	99.0	99.2	99.4	99.5	99.6	99.7	99.8
Company F																					
Degree-Days per Season	4805	4865	4917	4966	5007	5046	5079	5111	5137	5162	5181	5199	5212	5225	5235	5245	5251	5257	5262	5266	5269
% of Normal Season Degree-Days	90.9	92.1	93.1	94.0	94.8	95.5	96.1	96.7	97.2	97.7	98.1	98.4	98.7	98.9	99.1	99.3	99.4	99.5	99.6	99.7	99.8
Company G																					
Degree-Days per Season	4645	4714	4774	4832	4882	4929	4969	5006	5039	5069	5095	5120	5141	5161	5178	5194	5207	5219	5229	5239	5248
% of Normal Season Degree-Days	87.6	88.9	90.1	91.2	92.1	93.0	93.7	94.4	95.1	95.6	96.1	96.6	97.0	97.4	97.7	98.0	98.3	98.5	98.6	98.8	99.0

*14-year averages

Company A: Worcester, Mass.
Company B: Cambridge, Mass.
Company C: New Bedford, Mass.
Company F: Trenton, N. J.
Company G: Indianapolis, Ind.

Significance: The figure 5738 for Company A, Col. 1 directly under 31 are the seasonal degree-days below 31 for days with degree-days less than 31. This figure of 5738 represents the seasonal degree-days and hence volume of gas which a plant designed for base block of degree-days below 31 would have to make.
The figure 84.3 in first column under 5738 for Company A shows that these 5738 degree-days are 84.3 per cent of the total normal season degree-days, or a plant designed for the base block of degree-days below 31 would have to produce 84.3 per cent of the annual heating consumption.

it is necessary only to count the number of days per season with 30 or more degree-days per day. For the value of L at the 40 degree-day level, count the days with 40 or more degree-days, etc.

3. *How the value of L per peak block of the maximum total daily demand was obtained:* By definition a peak block of the maximum total daily demand is that portion of daily demand which is not a regular seasonal expectation, and also by definition a block is more than 1 degree-day of daily demand. The value of L for various peak blocks was determined as follows:

A. Determine the largest consecutive 3-day average degree-day that the plant total daily capacity must supply. In these studies the largest consecutive 3-day average degree-day day that has occurred during the past 14 years has been used.

B. Select the level of the degree-day days for which the value of L for certain peak blocks are to be calculated. In this study peak blocks above 30-31-32 degree-day days, etc., up to a 50 degree-day day have been selected.

C. Determine the number of seasonal degree-days above each selected level (14-year average figures have been used).

D. Divide the seasonal degree-days found in (C)—for the selected peak block—by the difference between the largest consecutive 3-day average degree-day day and the selected degree-day day level.

For instance, to determine for Company A the value of L or number of days' use per year, over a 14-year period, that would be made of a plant daily capacity designed to supply the peak block of the maximum total daily demand above a 30 degree-day day, proceed as follows:

1. Determine the largest consecutive 3-day average degree-day day. For Company A this is 66.

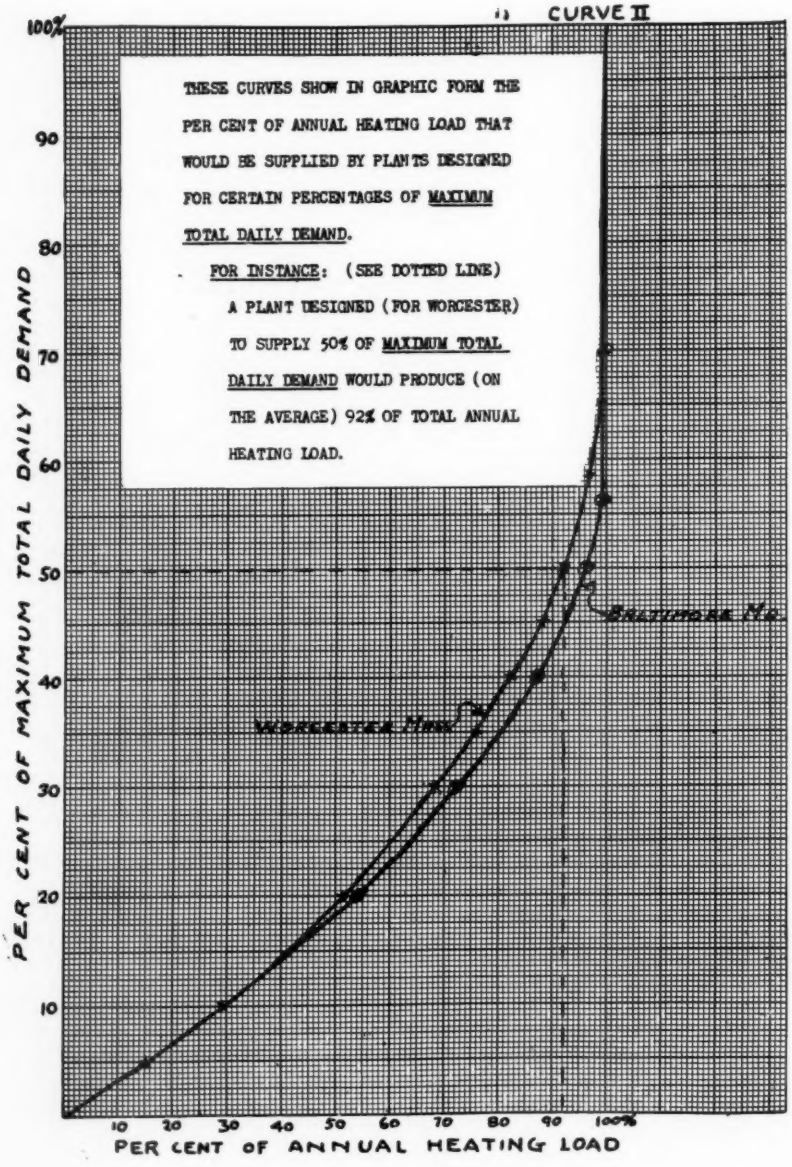
2. Calculate the 14-year average seasonal degree-days above 30 for all days with degree-days larger than 30. This was found to be 1063.2.

3. Therefore $L = \frac{1063.2}{(66\text{-}30)} = \frac{1063.2}{36} =$ 29.5 days.

Similarly, the value of L for peak block above a 31 degree-day day for Company A was found to be

$$L = \frac{963}{(66\text{-}31)} = \frac{963}{35} = 27.5 \text{ days}$$

The value of L was determined in this manner for different peak blocks of the maximum total daily demand for



Farm-fuel

● Gas may be the ideal fuel for cooking, heating and refrigerating in the home but to millions of U. S. farmers it may soon be much more than that. Already in use on countless farms for chicken brooding, sanitizing, poultry cleaning and many other tasks, LP-Gas may take the place of non-existent labor in one of the most important crop-producing operations: weed removal.

With LP-Gas, it is possible that the arduous task of removing weeds from growing crop-fields will become a matter of a convenient hour or so for one man instead of the now-normal day or more for many hands.

The new development will largely be the result of efforts and experiments with flame control of weeds by Buford H. Grigsby, assistant professor of botany, and Keith C. Barrons, associate professor, department of horticulture, both of the Michigan State College of Agriculture and Applied Science at East Lansing, Mich.—Bert Dale, *LP Gas.*

different degree-day day blocks and for each company.

4. *How the value of L per base block of the maximum total daily demand was obtained:* By definition a base block of the maximum total daily demand is that portion of the daily dem and which may be expected to occur seasonally. To determine the value of L for certain base blocks, proceed as follows:

A. Select the level of the degree-day days for which the value of L for certain base blocks is to be calculated. These may be for base blocks below 50-49-48 degree-day days down to 30 degree-day day or lower.

B. Determine the number of seasonal degree-days below each selected degree-day level, i.e., below 50-49-48 degree-day days for all the days per heating season (14-year average seasonal figures have been used in this study).

C. Divide the seasonal degree-days found in (B) by the selected degree-day level, i.e., 50 or 51, depending on the level selected.

For instance, to determine for Company A the value of L or number of days' use per year (14-year average) that would be made of a plant daily capacity designed to supply the base block of the maximum total daily demand below a 31 degree-day day.

First, determine (14-year average) the seasonal degree-days below 31 for all days per season. These were found to be 5738 degree-days.

The daily degree-days that the base block plant must supply are 30 degree-days since the plant is to handle all degree-days below 31.

Therefore $L = \frac{5738}{30} = 191.3$ days

This means that a plant of daily capacity equal to 30 degree-days would produce in 191.3 days (if operated at full daily capacity) the seasonal heating requirements for degree-days below 31 for all the days requiring heat.

5. *How maximum 10-year average degree-day day was obtained:* The maximum 10-year average degree-day day was obtained by setting down the degree-days for the past 10 years for each day of the heating season. These degree-day figures were then totaled for each day and divided by 10. Thus all of the degree-day figures for Sept. 15 were set down and totaled and then divided by 10; this then gave the 10-year average degree-day value for Sept. 15. Similarly the same was done for Sept. 16, etc., for each day of the heating season. From these 10-year average degree-day figures the maximum 10-year average degree-day day was selected.

Basic Data Obtained

In order to determine the characteristics of the heating load, it is necessary to obtain the following data:

1. A list of the days with degree-days above some *base* degree-day day for each heating season over a period of years. (In this study we have obtained such data for days with degree-days 30 or larger and for the past 14 heating seasons. Due to its length, this tabulation is omitted.) For certain sections of the country a base as low as 20 degree-day might be preferable and some companies may wish to use a longer period of years than 14. Table 1 is used in compiling data, one for each month.

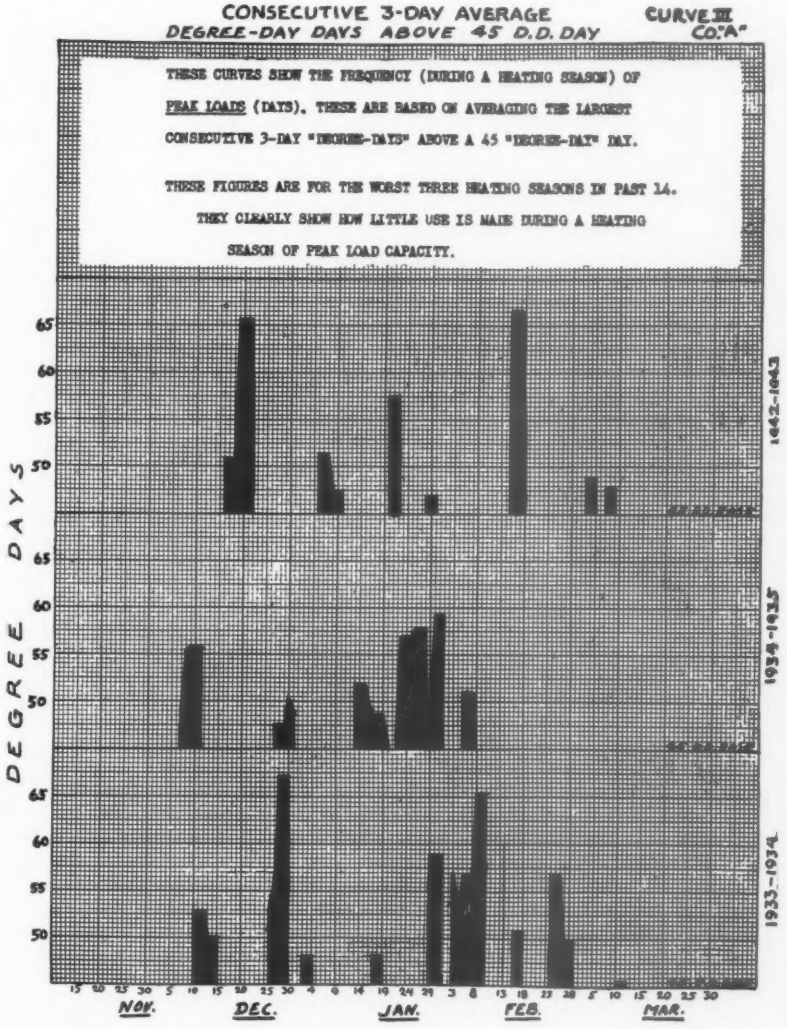
2. The seasonal degree-days per year for a number of years. See Table 2.

3. The normal seasonal degree-day. See Table 2.

Calculated Data

From the basic data the following was obtained or calculated:

1. The 10-year average degree-days by days for each day of the heating season. From these data was selected the maximum 10-year average degree-day



day. See Table 2.

2. The days for each season of the past 14 with degree-days larger than the maximum 10-year average degree-day day. The results for one company (Company A) are shown in Curve I.

3. The largest consecutive 3-day average degree-day day for each company over the past 14 years. See Table 2.

4. The largest degree-day day for each company over the past 14 years. See Table 2.

5. The value of L, i.e., the number of days' use per year of plant daily gas manufacturing capacity when designed for the following conditions:

A. To supply the maximum total daily demand. See Summary Table I, item 3.

B. To supply a segment, i.e., 1 degree-day of daily peak at different degree-day levels. Table 3 gives values for Company A by years and Table 4 shows the 14-year average values for the companies studied.

C. To supply peak blocks of the maximum total daily demand for peak blocks above 30-31-32, etc., degree-days (based on 14-year average). See Table 5. (For certain sections of the country these should be determined for peak blocks above 20, 21, 22, etc., degree-days.)

D. To supply base blocks of the maximum total daily demand for base blocks below 50-49-48 degree-days down to 30 degree-day. (Based on 14-year average.) See Table 5. (For certain sections of the country these values should be determined down to 20 degree-days.)

6. The number of degree-days per season (14-year average) corresponding to certain peak blocks of the maximum total daily demand and their per cent of normal season degree-days. See Table 6.

7. The number of degree-days per season (14-year average) corresponding to certain base blocks of the maximum total daily demand and their per cent of normal season degree-days. See Table 7.

Significance of Data

1. From an analysis of the days with degree-days larger (colder) than the maximum 10-year average degree-day day for the past 14 years (see Curve I) we find there are but a few days below zero, i.e., with 65 degree-days or more. Companies A and G shown not more than four such days in any one year, Company H none.

2. To supply the maximum total daily demand requires a relatively small number of days' use per year of maximum total plant daily manufacturing capacity. The following Summary Table No. 1 shows this data:

SUMMARY TABLE NO. 1

	A	B	C	E	F	G	H
1. Largest consecutive 3-day average degree day	66	63	59	65	63	65	53
2. Normal seasonal degree-days	6801	6022	5310	7131	5231	5293	4533
3. Number of days' use per year of maximum total plant daily manufacturing capacity	103	95.6	98.3	109.7	83.8	81.5	85.5
4. Annual load factor	28.2%	26.2%	26.9%	30.0%	22.9%	22.4%	23.3%

Here we see that if Company A designed a gas plant with a total daily plant capacity equal to the load on the largest consecutive 3-day average degree-day, such a plant operating at full capacity could produce in 103 days the seasonal heating load. For Company G only 81.5 days' use of full plant daily capacity would be required. The annual load factors are 28.2 per cent and 22.3 per cent, respectively. These figures show the variations in load factors as between certain sections of the country and the relatively poor load factor of a plant designed to supply the full heating load.

3. To supply certain peak blocks of the maximum total daily demand requires but a small number of days' use per year of peak load plant daily manufacturing capacity. For instance, if each company were to design a peak load plant to handle the peak block of the maximum total daily demand above its maximum 10-year average degree-day day, such peak load plants would supply (see Summary Table No. 2) from 30 to 35 per cent of the maximum total daily demand but would produce on the average less than 2 per cent[2] of the seasonal heating load for all but one company and for that one 2.9 per cent. Furthermore, such peak load plants would have to operate only (on the average) for from 4.3[2] to 6.8[2] days per year at full capacity to manufacture the corresponding seasonal gas requirements. These figures indicate clearly the necessity for close scrutiny of plant investments which are to be used so few days per year and which will be called on to manufacture so small a percentage of the total seasonal heating load.

4. To supply certain base blocks of the maximum total daily demand requires a substantial number of days' use per year of base load plant daily manufacturing capacity. If each company studied were to design a base load plant to handle the base block of daily peak demand below their maximum 10-year average degree-day day, such base load plants would supply (see Summary Table 3) on the average[2] from 63.5 to 69.7 per cent of the maximum total daily demand and from 97.1 to 98.2 per cent of the total seasonal heating load. Such base load plants would operate (on the average) 122 to 145 days per year at full capacity to produce the corresponding seasonal gas consumption. (See Curve II.)

The maximum 10-year average degree-day day for each company was selected to show the use of peak load and

SUMMARY TABLE NO. 2

	A	B	C	F	G	H
1. Largest consecutive 3-day average degree-day day	66	63	59	63	65	53
2. Maximum 10-year average degree-day day	46	43	40	40	42	36
3. Difference between (1) and (2) of this table	20	20	19	23	23	17
4. % that (3) is of (1) of this table	30.3	31.7	32.2	36.5	35.4	32.1
5. Seasonal degree-days for days larger than (2) of this table. 14-year average	132	110	123.2	100	157	94
6. % of that (5) are of the normal seasonal degree-days	2	1.8	2.0	1.8	2.9	2.1
7. Value of L for peak block shown in (3) of this table	6.6	5.5	6.5	4.3	6.8	5.5
8. Normal seasonal degree-days	6801	6122	5800	5281	5298	4533

SUMMARY TABLE NO. 3

	A	B	C	F	G	H
1. Maximum 10-year average degree-day day	46	43	40	40	42	36
2. % (1) of this table is of largest consecutive 3-day average degree-day day	69.7	68.3	67.8	63.5	64.6	67.9
3. Seasonal degree-days for days equal to (1) of this table or less	6669	5912	5676	5181	5141	4438
4. % (3) of this table is of normal seasonal degree-days	98	98.2	98	98.2	97.1	97.9
5. Number of days' use per year base block below (1)	145	138	142	129	122	123

[2] These figures are 14-year averages. There will be certain years when more than these quantities will be produced and when less is produced. See Table 2 for seasonal variation.

base load plants when certain peak blocks and base blocks of the maximum total daily demand are selected for plant design. This was done for illustrative purposes and not because this represents the most economical breaking point for these two types of plants. In a later section the relative economics of supplying certain peak blocks and base blocks of the daily heating load will be outlined more fully.

5. From a study of the data showing the number of days' use per year of plant capacity to supply a segment, i.e., 1 degree-day of the daily demand, we see that the number of days' use varies widely for the different degree-day levels and between companies at the same level. The value of this type of data will become evident in Parts III and IV of this study.

Conclusions

These studies clearly indicate the small number of days per year that plants designed for certain portions of the daily heating demand would be called upon to operate. It is evident that if we determine the relative overall costs of producing gas by different methods and processes and for different load factor conditions, we can use data of the type outlined herein to select that portion of the daily and seasonal heating load which can be supplied most economically by one gas manufacturing method and that portion which is supplied most economically by some other gas manufacturing process.

In the next two parts of this study we will show the formula developed in Part I and the type of data presented in Part II can be used in a proper selection of plants to produce the most economical overall gas production costs.

Safe Driving Record of Pittsburgh Group

FOUR hundred and fifty trucks and automobiles operated by the Pittsburgh group of public utility companies within the Columbia Gas & Electric Corp., travelled 5,354,621 miles during 1944 and were involved in only 45 accidents.

W. H. Adams, safety director of the Pittsburgh group, said that this was the lowest accident record in nearly 20 years of safety activity within the group which comprises the Manufacturers Light & Heat Co., the Natural Gas Co. of West Virginia, the Cumberland & Allegheny Gas Co. and the Gettysburg Gas Corporation.

"Tricks and Treats"

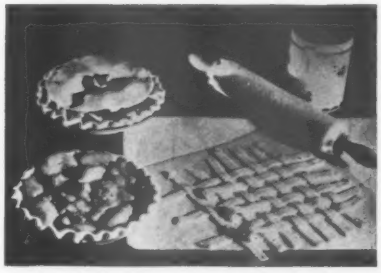
Spring showing of a new wartime gas cookery color-slide lecture prepared by Southern California's home service department

Mercedes Bates

TELL it with slides—tell it in color," is the rule followed by the Home Service Department of Southern California Gas Company in preparing illustrated cookery lectures for small audiences.

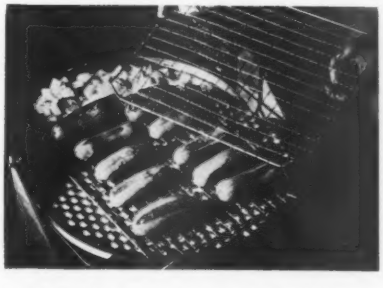
According to Mercedes Bates, supervisor, the department's most recent achievement is a new color picture lecture entitled "Tricks and Treats" which is now having spring showings in and about Los Angeles. Frankly slanted toward women's club groups, the new slides illustrate wartime cookery tricks that save time and ration points and yet provide food treats. Because women-audiences react so audibly and enthusiastically to beautiful food "shots," the slides glow with color. Hours were spent by department members planning, designing, and arranging the "sets." Corris Guy was director-in-chief and Maynard Parker cameraman.

Corris Guy



Miss Bates' favorite shot. In color it's tantalizing. Against the dark green background is high-lighted the unbaked "floater-top" (eliminates boil-overs) pie filled with wedges of unpeeled red apples. Below, lush, yellow frozen peaches await lattice covering. (Strips of pinked pie dough are first woven on waxed paper and then flipped onto pie). The sock-covered rolling pin is a never-fail trick

Glassware top-o'-the range tricks: (1) How to cook a "block" of frozen vegetables. (2) Cooking beets in bottom of double boiler—making Harvard Sauce in top! (3) Golden mashed potatoes "accentuates the positive"; —the trick: cook and mash potatoes with carrots or rutabagas; the treat: color and flavor



Stuffed "franks" and hot potato salad from the broiler! A trick to show how broiler pan and grid may be used simultaneously. The frankfurters are placed between two cake racks for easy turning

Supper medley—a Mexican pottery dish which goes to the table as is. "Talking points": it's an excellent meat extender; water soluble vitamins and minerals are retained; can be prepared in advance and saves dishes!

Utility Promotion and Merchandising Get Dealer Nod in Jersey Survey

DEALER sales of electric and gas appliances are in direct ratio to the aggressiveness of utility merchandising and promotional efforts, and the more aggressive the utility merchandising the greater the profit the dealer makes, according to a recent survey made among dealers by the Jersey Central Power & Light Company. Utility promotional and merchandising efforts create prospects and floor traffic for the dealers, help to eliminate unethical practices and raise the standard of all equipment which the dealer sells, is the opinion of the dealers interviewed.

Not only do these dealers want utilities to merchandise, but of the 183 interviewed, 89% indicated they would be interested in a dealer cooperative program sponsored by the utility company.

One of the most interesting phases of the survey, according to B. A. Seiple, vice-president in charge of sales, was the fact that the strongest advocates of aggressive utility merchandising and promotion were the dealers who produced the greatest volume of business.

Indicative of the aggressiveness of the dealers in this territory is the fact that approximately 40% of the dealers will employ outside salesmen and 72% will have a definite postwar advertising program. Of the 124 dealers who plan to advertise, 105 will use newspapers, 28 direct mail, 3 radio, and 9 billboards.

When asked what the utility companies could do to help the dealer in promoting the sale of appliances, 30% of the dealers indicated that the utility advertising and promotion of appliances is of the greatest value. Most dealers indicated that they would prefer to have the utility advertise appliances without mentioning brand names. However, some felt that utility brand advertising was helpful to their own sales as it enabled the dealer to tell his own brand story, and this increased his total volume.

Of secondary importance, dealers mentioned the work done by utility contact men as an important sales aid to them. Dealer contact men not only keep them informed of new developments but also supply valuable information which allows dealers to tie-in their sales efforts with the utility promotion.

Almost without exception, dealers indicated that they wuld push higher grade merchandise after the war. Practically all dealers stressed the importance of well known brand names as a valuable sales asset, and emphasized that such buying guides as a "CP" symbol on gas ranges will be valuable sales tools.

Timely advertisement which capitalizes on current events. Dorothy F. O'Meara, Bridgeport home service director, contributed the idea

Servel Enters Water Heater Field

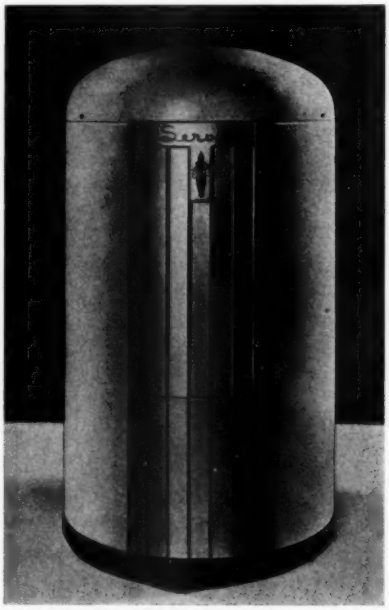
AS soon as manufacturing facilities now devoted to war production are available, Servel Inc., manufacturers of gas refrigerators, will produce a new line of gas water heaters.

In addition to the 30-gallon model illustrated, 20-gallon and 45-gallon sizes will be manufactured. All heaters will be of automatic storage type with 100% safety controls on main burner and pilot. A spherical tank is used in the 20-gallon model and elongated spheres in the 30-gallon and 45-gallon sizes. Tests indicate exceptionally high efficiency and low standby heat loss in this design.

Consumers' Preference Heeded

The overall dimensions of the 30-gallon model are: 24 inches in width, 44⅜ inches in height, and 26¾ inches in depth, including draft diverter. These dimensions are shorter and greater in diameter than the conventional 30-gallon automatic gas water heater. Preference for heaters of shorter height and larger diameter was shown by gas utilities representing over half of the gas meters in the United States, in a recent appliance survey conducted by the American Gas Association.

One of the outstanding features of the Servel gas water heater line is the amount of insulation engineers have been able to use in this heater. Insulation will average more than 50% thicker than that used in conventional type automatic storage gas water heaters.



One of Servel's new 30-gallon water heaters

Gas Stove Production

PRODUCTION of gas cooking stoves for rationing during the year ended Jan. 31, 1945, was 568,000, compared with 2,100,000 for the base period (the year ended June 30, 1941), according to the Office of Price Administration's Rationing Division.

Sales to certificate holders for the year ended Jan. 31, 1945, were 556,000, compared with 1,990,000 during the base period (best year, 1941 or 1942, for each registrant).

Allowable inventory currently authorized is 207,000, while manufacturers' actual inventory is 25,000 and actual trade inventory 77,000.

Production of gas heating stoves for the same periods were 580,000 and 1,300,000, respectively. Sales to certificate holders during the year ended Jan. 31, 1945, were 605,000, compared with 1,900,000 in the base period. Allowable inventory currently authorized is 546,000, with manufacturers' actual inventory 22,000 and trade's actual inventory 107,000.

Surface Combustion Move

ALL New York City offices of Surface Combustion Corp., with headquarters at Toledo, Ohio, have been consolidated at 315 Transportation Building, 225 Broadway, New York 7, the company announces.

The move, effective May 1, makes possible one centralized location for all divisions including the Janitrol gas-fired space heating division, aircraft and portable heater divisions, industrial heating division and the Kathabar humidity control division. The personnel and operations of each division continue unchanged.

Aids for Utility Home Planning Departments Offered by Surface Combustion

GAS companies throughout the country are being encouraged to establish home-planning bureaus in a newly-launched program of Surface Combustion Corp., Toledo, Ohio, which has prepared detailed plans for utilities to use in organizing and operating such bureaus.

The company which manufactures "Janitrol" heating equipment has incorporated the working plans for a home-planning bureau in a book which emphasizes the importance of gas company co-operation with heating dealers, architects, builders, lumber and supply companies, mortgage institutions and department stores.

Plans for setting up and publicizing a central clearing house on building information and displays for prospective home builders are in Surface Combustion's "Quick-Get-away" program. Display booths, miniature model homes—a new one every month—newspaper and radio advertising samples, and several different books are a part of the program which may be obtained by gas companies who start home-planning bureaus.

One of the most important pieces of material furnished for general distribution is "Let's Plan A Peacetime Home," an interesting and practical book covering every phase of home planning for the owner. It is a guide which helps the home planner decide what type of home he wants and gives him a better appreciation of the key factors in home building. Authors of the book are Mary Davis Gillies, interior decorating editor of McCall's magazine; Kenneth K. Stowell and Emerson Goble, editor and managing editor, respectively, of Architectural Record; and H. V. Walsh, architect, writer and lecturer.

The housing bureau plans may be modified or amplified by the local gas company, according to Surface Combustion. Steps for organizing and operating a bureau are made available at this time so that the utilities may be fully prepared to establish one by this fall, or sooner if necessary.

Spars Prepare for Postwar Homemaking

GETTING one dinner is enough to fuss most women. How would you like to have four dinners cooking at once? Elsa Steinberger of The Brooklyn Union Gas Company did it, juggling two oven meals, one in the broiler and one on top of the stove, while she chatted about how to plan meals. So says Collier's magazine, for April 21, 1945, in a story entitled "When the Girls Come Home."

Enlisted Spars stationed in New York City, looking ahead to postwar living, asked their officers to arrange a homemaking course for them. The officers in turn approached the Home Economics Women in Business group, and the project was under way. The Spars led off with a luncheon at the Women's Service Club at which their plan was proposed to a group of home economists who were their guests; a committee was appointed to organize a course which would include grooming, textiles and clothing (including fashions), interior decoration, budgeting, and food nutrition.

Ruth Soule of The Brooklyn Union Gas Company was responsible for the food and nutrition section of the course, for which seven of the fifteen evenings were set aside. Key people in the home economics field, coming from as far away as Minneapolis, gave talks and demonstrations on nutrition, marketing and care of food, baking, meat cookery, eggs, milk and cheese, fruits and vegetables, and whole-meal planning and cookery.

Most of the meetings were held at the Herald Tribune Institute; but the last of the food and nutrition series, a demonstration on whole-meal planning and cookery, was held at The Brooklyn Union Gas Company so the Spars might see a demonstration kitchen, and the kind of demonstration that could be given only in such a kitchen.

The project was most satisfying to everybody connected with it; while sustained attendance during the fifteen-week period was less than the Spars had hoped, enthusiasm was greater than anyone had expected. The appreciation of the Spars was made evident in many ways—by glowing comments, letters and a formal certificate.

Elsa Steinberger during a food demonstration presented for the Spars

Below is Miss Steinberger talking with Spars and also demonstrating the technique of meal planning

The United States Coast Guard
Presents to
Ruth Soule
This
Certificate of Appreciation
In recognition of valuable services freely and unstintingly rendered.

Formal expression of Spars' appreciation

Portland Gas Distributes A. G. A. Sales Policy Recommendations

PORTLAND (Ore.) Gas & Coke Company is distributing to 250 furniture store, appliance and plumber dealers in its operating area a statement of sales policies which will determine in general the utility's postwar activities in the field of gas appliance merchandising.

To put its basic intentions on record, the utility used the statement of sales policies composed in cooperation with the National Retail Furniture Association, Gas Appliance Societies and other retail trade groups, and which was recommended by the executive board of the American Gas Association. (A. G. A. MONTHLY, Jan., 1945, p. 33.)

"Portland Gas & Coke Company is happy to announce to you that our plans are being developed to prepare a market for you when appliances are again available," declared the personally delivered letter of transmittal which was signed by R. G. Barnett, vice-president and general manager.

"We want to tell you *now* that these 12 recommendations will be the fundamental principles of the dealer cooperative plan of your gas company. All of our thinking and planning for the future is based on making it advantageous for you to stock, sell, and advertise gas appliances.

"Plan now to sell gas appliances aggressively in the postwar period. Our home economist, sales and service follow-ups will make it possible for you to *retain profits* made on the sale of gas appliances to satisfied customers."

Dealer coordinators are delivering and reviewing with their dealers the policy statement which is attractively reproduced on a sheet of heavy paper suitable for posting for ready reference.

While thus placing their company's cards on the table, the coordinators also are using the opportunity of the interviews to ask dealers themselves a few pertinent questions regarding their postwar thoughts and plans. The results, when compiled, are expected to be of great help in working out final phases of the postwar dealer cooperative merchandising program.

Optimist

● On November 18, 1940, Paul A. Cruit, sales representative for the Gas Service Co., Eldorado, Kan., called on Ruben Waller, who on that date was past one hundred years old. Paul explained to Mr. Waller that the company was having a range sale and that he could buy a badly needed range on thirty-six monthly payments. After duly considering the proposition, Mr. Waller signed the contract.

Born Jan. 5, 1840, he not only lived to pay out the contract, but is still living, now 105 years old, and is enjoying food cooked on the gas range. Mr. Waller was a slave in his early life, but has lived in Eldorado for many years.

Probably the most essential thing to a salesman taking long-term contracts, is not to be an optimist, but to know his customers, as apparently Mr. Cruit does.—*Gas Service*

No Accident Record Extends 29 Months

APPROXIMATELY 200 employees of the Manufacturers Light and Heat Company, Pittsburgh, and its associate, the Natural Gas Company of West Virginia, who are regularly engaged in the distribution and sale of natural gas in utilities' districts No. 2 and 7 have recently passed the twenty ninth month mark of continuous work without suffering any disabling injuries.

This announcement was made by W. H. Adams, safety director of the Pittsburgh group of companies of the Columbia Gas & Electric Corporation.

Peoples to Supply Johnstown Gas Users

THE Peoples Natural Gas Company on April 6 completed arrangements to take over from the Pennsylvania Electric Company the sale and distribution of natural gas to 18,500 users in Johnstown, Pa. and vicinity.

Penelec disposed of its franchise nd physical properties—gas mains and other facilities—to the Pittsburgh firm for a consideration approximating $1,200,000, according to an announcement by President Philip H. Harris and President Edward M. Borger of Peoples.

June 30 is stipulated as the date on which the transfer of interests becomes effective. While Peoples negotiates such details as establishment of a commercial office here and coordination of operating and maintenance personnel on transfer from Penelec, billings will be made by Penelec and all collections and customer contacts will be handled at Penelec's office. Penelec's withdrawal as applying to billing and other details will be completed within 60 days of the June 30 closing date.

Colin U. Miller will be retained by Peoples as superintendent, a post he filled in Penelec's gas department. Penelec employees in the gas department likewise, numbering about 37, will be offered similar employment by Peoples with the exceptions that Penelec will retain portions of the meter-reading group and maintenance and service personnel who work jointly in the gas and steam heating departments.

Panhandle to Increase Delivery Capacity

THE Panhandle Eastern Pipeline Co., Kansas City, Mo., has been granted permission by the Federal Power Commission to construct facilities to increase the present 333,000,000 cubic-foot daily delivery capacity of its main line by 50,000,000 cubic feet per day. Planned to relieve shortages in the Appalachian area, the increase was urged by the War Production Board.

Panhandle proposes to use the increased capacity principally to supply natural gas to The Ohio Fuel Gas Co. at two existing pipe line interconnections, one near Maumee, Ohio, the other at the Ohio-Indiana state line east of Muncie, Indiana.

New facilities are expected to be completed by November 1, 1945 at a cost of $8,325,000.

1,216-Mile Gas Line to Detroit Proposed

APPLICATION for permission to construct and operate a natural gas pipe line of ultimate 320,000,000 cubic feet daily capacity from the Hugoton gas field near Guymon, Okla., to Detroit, Mich., has been filed with the Federal Power Commission by the American Light & Traction Company. Planned as a postwar project, construction would begin about March 1, 1946 and completed before October 31, 1947.

If approved, the main line as finally completed would be about 1,216 miles in length, the initial construction being limited to about 1,076 miles, the application states. Eight hundred and sixteen miles would be constructed of 26-inch pipe and the remainder of 22-inch. Initial capacity of the line would be 150,000,000 cubic feet per day. Overall cost of the initial construction is estimated to be $49,000,000.

Switzerland Faces Gas Shortage

UNTIL September 1944, the Swiss gas industry was able to maintain almost the prewar output of gas. Since then no more coal had been imported up to the end of February according to advice just received here from the Swiss Gas and Water Association and "the position of Swiss gas works has become critical. At this moment we try to produce gas with the coal we have left and with wood."

In February and immediately thereafter, gas supply was reduced one half. There is no immediate prospect for facilities to import bituminous coal and coke from the United States as Switzerland did immediately following the first World War, and which it is hoped to do later. The Swiss Association fears that until there is relief only 100 cu.ft. of gas per person each month would be available for cooking and none for water heating and room heating.

Cities Service Reports Record Gas Sales

THE natural gas subsidiaries of Cities Service Company expended more than $11,200,000 in the acquisition or construction of new facilities in 1944, according to the company's annual report. Of this amount, over $7,200,000 was spent in the construction of gas transportation and gathering facilities, the greater part of which was for completion of the Hugoton 26-inch pipeline and for additions to gathering and compressor station facilities appurtenant to this line.

Approximately $3,000,000 was expended in the drilling of gas wells and the acquisition of leaseholds. Gas distribution and other facilities were constructed or acquired at a cost of more than $1,000,000. Approximately $1,200,000 was received from the retirement during the year of miscellaneous investments in unconsolidated gas company securities.

Total sales of natural gas of 236 billion cubic feet, reported by Cities Service, exceeded the sales in the previous peak year of 1943 by 27 billion cubic feet, or 13%. Residential and commercial gas sales increased 3 billion cubic feet, or 7%, due to a larger number of customers and to larger average requirements per customer under wartime fuel and housing conditions.

Other gas sales, including sales to industrial customers and to non-affiliated gas companies, increased 24 billion cubic feet, or 15%, principally because of the expanded requirements of war and essential civilian industries. Total natural gas customers served directly on December 31, 1944 were 535,704, an increase of 17,588 during the year.

El Paso to Recover Residue Gas

EL PASO Natural Gas Co., El Paso, Texas, has received from Federal Power Commission authorization to install and operate facilities in Lea County, New Mexico, designed to increase recovery of wasted residue gas from 76,000,000 cu.ft. per day to 96,000,000. The facilities authorized include 31.5 miles of 16-in. natural gas pipe line beginning at the company's Eunice compressor station in Lea County and extending south to Jal Plant No. 1. Also the company is to construct and operate five 800-hp. gas compressor units and two 175-kw. gas-engine-driven generators at the Eunice station; two 24-in. scrubbing towers of 13,000,000 cu.ft. daily capacity at the Eunice station, and two 24-inch scrubbing towers of 26,000,000 cu.ft. daily capacity at the Jal plant.

This will enable the company to deliver into its pipe lines 20,000,000 cu.ft. per day of hitherto wasted gas, thus conserving an equal volume of gas the company is daily withdrawing from its reserves. The company has been obtaining 76,000,000 cu.ft. daily of residue gas, including 34,000,000 ft. from Phillips Petroleum Co. The additional 20,000,000 ft. will be supplied by Warren Petroleum Co.

George S. Jones, Jr., vice-president in charge of sales for Servel, Inc., gets in a few pointers on gas air conditioning as Bob Lewis, advertising manager for the Washington, D. C. Gas Light Co., cools off in one of the ice chambers of Washington's Statler Hotel

Calls Distribution Key

STRESSING the importance of distribution in the set-up of our national economy, George S. Jones, Jr., vice-president in charge of sales for Servel, Inc., told the Washington, D. C. Advertising Club that postwar employment would depend to a large extent on how distribution was handled by industry.

Addressing the April 10 luncheon meeting of the club at the Statler Hotel, Washington, Mr. Jones spoke on the subject, "Let's Define Distribution."

Mr. Jones, who is a pioneer in the field of automatic refrigeration, is also president of the National Federation of Sales Executives.

Baltimore Wins Plaque for Blood Donor Project

LAST month the Consolidated Gas Electric Light and Power Company of Baltimore was awarded a plaque by the 29th Division Association in recognition of the firm's "excellent cooperation given the blood donor project." Coincident with the award made to the utility, 46 of its employees—members of the Gallon Club—were presented individual plaques at exercises held in the Maryland Casualty Auditorium. The company now has 86 Gallon Club members with more becoming eligible every week.

Four Two-Gallon Club members employed by the company also were honored. They are: Michael A. Pusateri, J. Theodore Wolfe, Vernon R. Smith and John C. Snyder.

Henry R. Cook, Jr., vice-president of the company, in accepting the plaque emphasized that all employees had given their blood voluntarily; although the company had given the effort widespread publicity and allowed employees who donated their blood time off with full pay to make the donation.

In making the awards, William C. Nicklas of the 29th Division Association pointed out that the Gas and Electric Company has more Gallon Club members than any other organization of its size in the Baltimore area. Also, that this was the first time the 29th Division Plaque had ever been given except to an individual.

Pacific Coast Gas Sales Shatters Records

ALL records were again broken by the gas industry on the Pacific Coast in 1944, according to a recent news letter of the Pacific Coast Gas Association. Customers in California reached a total of 2,098,219, a gain of 2.8% over 1943. Total gas sales of 338 million Mc.f. and gross revenues of $121 million were 12% and 13.3% over 1943 respectively.

More gas appliances were sold on the Pacific Coast in 1944 than in 1943. The necessities of the greater population and liberalization of manufacturing controls during the summer brought gas range sales up some 30 per cent from the 1943 low, water heater sales up 45 per cent, and heating furnaces and stoves up more than 100 per cent. The number of appliances sold was, however, far below those sold in a normal prewar year and the unfilled demand at the close of 1944 was greater than at its beginning.

Accounting Section

Income and Excess Profits Tax Accruals

Frank Freer, Jr.

BY FRANK FREER, JR.

Public Service Electric & Gas Co., Newark, N. J. Chairman A. G. A. Taxation Accounting Committee

FEDERAL income and excess profits taxes represent one of the largest single payments made by many utility companies. The importance of relating tax accruals to net income has long been recognized and "Accounting for Income Taxes" is the title of a recent bulletin of the American Institute of Accountants. It is possible that differences between the tax on actual taxable income and the tax on estimated taxable income may be the difference between net income or a loss for the months under review. This is particularly so with the high tax rates now in effect. Many discussions have taken place among tax accountants on this subject, and because of the interest displayed, the Taxation Accounting Committee conducted a survey of current practices in the industry.

In the report which follows, no attempt has been made to recommend a course of procedure. What may be desirable and adequate for one company might be wholly inadequate for another company. With this in mind the practices of the various companies are presented in case form. Little or no change has been made in the outlines which were submitted by the various companies except to delete references to company names.

Case No. 1

No segregation is made between federal income tax and federal excess profits tax in monthly accruals. The monthly accrual for federal income and excess profits taxes is calculated on estimated monthly taxable income at a predetermined rate. Such rate is determined by calculating the estimated annual taxes on the estimated annual taxable income and as differences occur between the period to-date actual and period to-date estimated taxable income the tax rate is revised by calculating the annual taxes on the period to-date actual taxable income plus the revised estimated taxable income for the balance of the taxable period. Adjustments are then made to the prior monthly accruals.

Case No. 2

Detailed work sheets are prepared which are consolidated with Associated Companies work sheets before the return is filed. However, an estimated income statement is prepared early in the year on a monthly basis. The yearly income tax is estimated and allocated to the various months on a quarterly basis. This is done in order that the Consolidated Companies may prepare their yearly income statement at the end of each quarter. The income tax is allocated to each quarter on the basis of the income for that period, and prorated to each month on the percentage of income for the month.

The company's business is seasonal and may have a quarter during the summer where it is operated at a loss. No income tax is allocated to this quarter, regardless of whether one month in the quarter may show a profit.

Case No. 3

Monthly accruals of federal taxes for the first eleven months of the year are accrued on the basis of applying the "effective federal tax rate" to the cumulative taxable net income for the year to date, the provision for the current month being the difference between the cumulative provision at the end of the month and that at the end of the preceding month. The "effective federal tax rate" is a composite rate determined by dividing the estimated total of normal, surtax and excess profits taxes by the estimated taxable net income for the year. In December, calculations are made of normal tax, surtax and excess profits taxes based on the actual taxable net income for the year so that these figures are available for annual report purposes.

Under the peculiar conditions existing for this company, a larger portion of taxable income is earned in the first half of the year than in the last half, approximately 50% occurring in the first quarter, and 75% in the first half of the year. This permits the company to forecast within a reasonable degree of accuracy the taxable net income for the year after the lapse of a few months so that cumulative adjustments for changes in the effective tax rate do not unduly distort the income available for dividends in the latter part of the year.

Tests of the effective tax rate are made at frequent intervals throughout the year, particularly at the end of calendar quarters, by reference to twelve months' taxable income determinations, formal income estimates, and other factors not known or taken into consideration at the time income estimates are made.

The tax entry is the last one to be made each month, and no particular delay is experienced in closing since a preliminary income statement is drawn off before the final calculations of federal taxes are made. Only a few minutes are necessary to make these calculations and to prepare the entry.

It will be observed that interim figures do not show a segregation of the provision by the various types of federal income and excess profits taxes, and it has been found that such a segregation is unnecessary except for the calendar year which is also our fiscal year.

Case No. 4

Accruals for the current month are determined on the basis of year-to-date actual operations (after making the necessary adjustments to book income for tax purposes), less accrual to end of prior month. Excess profits taxes, if any, are not accrued until accumulated taxable income exceeds the annual excess profits credit. This method operates satisfactorily within this system of companies since the parent company is not currently subject to excess profits taxes and the amount of income of subsidiaries subject to such tax is minor in amount.

Due to the seasonal variations of the business, taxable losses are incurred in certain summer months of the year. No reversals of previous accruals are made, however, to reflect these taxable losses; such losses being considered in the subsequent months in which the companies have taxable income.

Case No. 5

For many years accruals of federal income and excess profits taxes were based on taxable income determined by the use of a combination of actual results of operations and estimated operations as shown by the annual budget. Under this procedure, accruals for each month of the calendar year represented

one-twelfth of the estimated annual tax as determined monthly, plus or minus an adjustment because of variations between actual results of operations and the budget. During the early months of an accounting period these plus or minus adjustments were not significant, but in the latter part of the period were large because the adjustments cover the entire period to date. As a consequence, explanations of differences between actual and budget figures became involved.

Early in 1944 studies were made to determine whether accruals could be based on actual taxable income for each month of the year. If this could be accomplished adjustments resulting from the use of the annual budget would be avoided.

It was first necessary to allocate the excess profits credit to each month of the calendar year. The simplest method would be to divide the annual excess profits credit by twelve. However, this method did not give effect to the seasonal variations of the business. Since the excess profits credit is based on the average earnings during 1936, 1937, 1938 and 1939, it was decided to calculate the average credit for each calendar month of the base period. Each of the monthly credits determined for the base period was adjusted for the credit resulting from capital additions. On an annual basis this adjustment was comparatively small, and because of the large amount of work involved in breaking it up into calendar months, it was decided to allocate one-twelfth of the capital additions credit to each month of the year.

Provides Stable Monthly Credit

This method of allocating the excess profits credit provided a stable monthly credit. Once the annual credit is audited by the Bureau of Internal Revenue, no significant change will occur from year to year.

The use of actual monthly income has a tendency to delay the preparation of the income statement, but these delays were reduced to a minimum by careful planning.

This plan requires the preparation of a preliminary income statement without the accrual for the current month's income and excess profits tax. Operating Revenue Deductions is the only figure which will change and with the exception of totals and subtotals, the income statement is completed.

Printed or mimeographed work sheets are used for the computation of taxable income. These work sheets include all the necessary adjustments for the determination of taxable income and all adjustments are entered on the work sheets prior to the completion of the preliminary income statement.

The actual period figures and the accumulated excess profits credit to date are used in computing the tax liability in order to correct any possible error in preceding months' accruals. Simultaneously, a tax computation is made for the month on the basis of the actual income for the month. This calculation serves as a check on the figures obtained by using the period figures. In addition, a delayed check of income is made the following month by checking the figures as of the beginning of the current month with the figures shown in the computation at the end of the preceding month.

This method of accruing federal income and excess profits taxes facilitates the explanation of differences between budget and actual figures and of comparisons with previous year's figures. In addition, the taxes accrued are the actual taxes payable on the income for the accounting period under review.

Case No. 6

Prior to 1944 in estimating each month's excess profits tax liability there was allocated one-twelfth of the excess profits credit (on the average income method) to each month of the year. It was found that this plan did not truly reflect monthly fluctuations of the company's income.

In 1944, the excess profits credit was allocated to the various months on the basis of a combination of budget and actual taxable net income—for example—in January the actual taxable net for the month was combined with the estimated taxable net from the budget for the months February through December, to obtain a twelve months' total. The percentage of January's actual taxable net to the twelve months' total thus obtained was applied to the excess profits credit to determine the amount applicable to January.

It was found that this 1944 method was not entirely satisfactory as it resulted in rather substantial variations in the provision for normal and surtax for corresponding months of 1944 and 1943 as recalculated on the same method as 1944, although there was no substantial variation in the excess profits credit between these years. If there isn't any change in the excess profits credit, any variations in the accruals should result from variations in taxable net income and should appear in the provision for excess profits tax only.

Although it was recognized that the proper method of apportioning the excess profits credit would be on the basis of the average months of the base period, to do this would have required a great deal of work due to the adjustments that had been made in such base years as the result of examinations of the Field Agents of the Internal Revenue Department. It was, therefore, decided that it would be satisfactory for accrual purposes to consider 1944 as the normal year, and a reallocation by months of the normal tax, surtax and excess profits tax was made for that year, the excess profits credit being apportioned to the various months on the basis of the percentage of that month's actual taxable net to the actual taxable net for the entire year. These new 1944 tax figures will be used for comparative purposes during 1945.

The estimated excess profits credit applicable to 1945 will be allocated for accrual purposes to the various months based upon the same ratios used for the re-apportionment of the 1944 excess profits credit, and it is anticipated that these same monthly ratios will continue to be used as long as the present form of excess profits tax is in effect. Except for minor changes in the excess profits credit, therefore, the normal tax and surtax should be comparable from year to year—any fluctuations due to variations in the taxable net income will occur in the excess profits tax.

Any possible errors in a previous month's accrual are automatically corrected through the method of using period taxable net and accumulated excess profits credit for the period in determining the tax liability.

Case No. 7

This company and its affiliates prepare tax estimates at the beginning of each calendar year and make three adjustments during the year to keep the estimates in line with current developments. The financial capital budgets, which are submitted quarterly every February, May, August and November, form the basis for these tax estimates. The first budget, of course, is prepared entirely from estimated figures. The second and later budgets make use of such actual figures as are available, combined with the latest estimates.

Each company supplies the Schedule "M" adjustments necessary to convert the capital budget figures to taxable net income. By combining the figures of the individual companies and making the proper eliminations and adjustments the consolidated taxable net income is determined. The consolidated

Absenteeism

● "Lost time is never found again; and what we call Time enough, always proves little enough."

* * *

"One Today is worth two Tomorrows."

* * *

"Dost thou love Life? Then do not squander Time; for that's the stuff Life is made of."

* * *

"The sleeping Fox catches no Poultry."

* * *

"Waste neither time nor money, but make the best use of both."

* * *

"Be ashamed to catch yourself idle."

* * *

"We may make these Times better, if we bestir ourselves."

* * *

"Sloth makes all Things difficult, but Industry all easy."

* * *

"It would be thought a hard Government that should tax its People one-tenth Part of their Time, to be employed in its Service. But Idleness taxes many of us much more, if we reckon all that is spent in absolute Sloth, or doing of nothing, with that which is spent in idle Employments or Amusements, that amount to nothing."

* * *

"Remember that *time* is money."

Early Sayings of Benjamin Franklin.

taxes accrued are computed from this latter figure.

In allocating the consolidated tax to the various companies, the formula outlined in Rule U 45-B of the Securities and Exchange Commission is followed. Under this method the percentage of the consolidated tax allocable to any company cannot exceed the percentage which such company's tax, computed on a separate return basis, bears to the total tax of all companies computed on separated return bases.

When the estimated tax figure for each company has been determined the amount applicable to each quarter, eliminating any loss quarters, is arrived at as follows:

1. The taxes applicable to each company as computed on the original estimate for the year, are allocated to the first quarter on the basis of the percentage which the estimated book earnings for the quarter bear to the estimated book earnings for the year. The taxes for the first quarter are allocated to January and February on the basis of book earnings for the month compared with estimated book earnings for the quarter.

2. Prior to closing accounts for the first quarter the second estimate is available and taxes assignable to the first quarter, based on this new estimate, are determined by the percentage the book income for that *quarter* bears to the estimated book income for the year. The difference between the total accruals for the first two months of the year and the estimated accrual for the first quarter is charged entirely to March.

The same procedure is followed in subsequent quarters with the accrual for the last month in each such quarter being sufficient to bring the accrual, for the year to date, into line with the new tax figure. The new tax figure is that portion of the new tax estimate as computed from the revised estimates, which the book income for the first ½ or ¾ etc. of the year bears to the new estimated book income for the year.

In other words, before closing accounts for the second quarter, the third estimate is available and a new tax figure based on this latest estimate is allocated to the first *half* of the year in the same proportion as the book income for the half year bears to the latest estimated book income for the year. The entire amount necessary to bring the accruals for the first five months up to the newly estimated accrual for the first half year is the amount accrued in June.

In September, the accrual is that amount necessary to bring the total accruals for the first nine months into line with an amount computed by applying to the *fourth* tax estimate that percentage which the book income for the first *three-quarters* of the year bears to the new estimated book income for the year.

In the case of a loss quarter however no taxes are accrued for that quarter. In this manner we avoid showing a red figure for taxes in any of our quarterly statements to stockholders.

Of course, under extraordinary circumstances when taxes, as computed on a revised estimate, are less for the entire year than the taxes already accrued in previous quarters, then a red adjustment would be made in the current quarter to correct such previous accruals to an amount arrived at as outlined above in step 2.

Case No. 8

The methods followed by this company in determining monthly federal tax accruals have been developed to satisfy the requirements of interim income statements and balance sheets. The company's taxable income is included in the consolidated tax returns of the holding company system of which it is a subsidiary. A direct result of this situation is that federal taxes are not determined solely on the basis of the company's realized taxable income, but are related to the consolidated return taxes of the holding company and affiliates.

In connection with the preparation of its annual operating budget the company estimates net taxable income by months and computes its total tax liability on a separate company return basis, using the invested capital method in the determination of excess-profits credit. To this separate return tax estimate is applied an "allocation factor" computed by the holding company, this factor being the ratio of the estimated consolidated return taxes to the aggregate separate return tax estimates of the several system companies.

The total estimated tax thus allocated to the company provides an average effective tax rate to be applied to the taxable income estimates for each month. In the event that actual year-to-date taxable income, computed monthly, exceeds or is less than the estimated taxable income a special tax rate is applied to such difference. This special rate, under present tax laws, is determined by applying the "allocation factor" to the net excess-profits rate of 85.5%. Each monthly accrual, therefore, is the difference between taxes computed at these two rates for the year-to-date period and amounts accrued during previous months of the period. It will be readily recognized, of course, that this formula is operative only when income deviations are in the excess-profits income bracket.

The company's operations are segregated into six accounting districts, for each of which taxable income is computed monthly for the period to date. When the monthly tax accrual is determined on a company basis the amount thereof is spread to the several districts on the basis of taxable income. Of course, the accruals cannot be computed until the taxable income for the "slowest" district is available, yet this situation rarely affects the preparation of preliminary income figures on schedule.

It has been found that interim accruals under this method provide results that do not differ materially from year-end calculations based upon actual tax allocations among the system companies. Results are generally checked as of June 30, in connection with taxable income estimates for capital stock tax declared value.

Why Not?

● A vacuum cleaner salesman doesn't attempt to sell vacuum cleaners without knowing how to clean rugs and furniture; the washing machine salesman knows how to do the family laundry; the sewing machine salesman can do a lot of plain and fancy sewing, so why should a range salesman try to sell ranges and fuel without knowing how to cook? Learning to cook is not difficult.—Celia S. Bush, director, home service department, the Estate Stove Co., in April *Butane-Propane News*.

Postwar Meter Reading Approved

POSTCARD meter reading by customers, wartime practice, is working out satisfactorily for The Harrisburg Gas Company, Harrisburg, Pa., according to Louis C. Smith, president. This company's experience is described as follows by H. S. Rand, assistant treasurer and office manager of the company:

"Because our customer relations experience indicated the desirability of rendering bills only from actual readings, the method described here was instituted to help fill the breach between the meter readings our regular readers are able to obtain and a 100% reading of all customer meters. The cost, which in our case is not much less than the cost of regular readers, was not a factor in prompting its inauguration.

"We were unable to obtain any male readers or a type of female suitable for reading work. However, there were female applicants who could be used to deliver bills or postcards from door to door which work involved no moral or physical hazard. A card was therefore designed which explained the reason for the request and asked the customer to copy the exact position of the hands of his meter on the (postage paid) card and drop in the mail box promptly.

"Nine routes, each constituting a day's work of a regular reader, are scheduled to be read each day. Of these, six are read by regular readers and three are covered by postcards. The routes covered by postcards are rotated so that the same customer is asked to read his own meter once in each three months. One girl is able to deliver the three routes in a day and in addition, addressograph a portion of them.

"The customer response is approximately 85%, the customer cooperation is excellent and the method thus far has been very satisfactory.

"In addition to being more economical than sending cards through the mail, the girl is able to hold back those cards inadvertently included which involve locations where batteries of meters exist and where the customer would not know which meter to record. Moreover, there are meters located satisfactorily from the standpoint of moral hazard and she is able to obtain the readings of these in the regular course of her work."

Servel Sales Selection Program

BY WALTER P. WOOD

Servel, Inc., Evansville, Ind.

TWENTY executives, representing the Michigan Consolidated Gas Company, the Union Gas Company of Canada, Ltd. and the Port Huron representative of the Detroit Edison Company, met at the Detroit Leland Hotel on March 19 and 20 for one of the first training clinic sessions covering the Servel Salesman Selection Program.

These training clinic sessions are the second step in the Servel sponsored program to aid the gas industry in rebuilding "top drawer" sales forces for the postwar battle of the fuels.

The first step in the plan was the introduction of the Servel Salesman Selection Program in a series of ten regional meetings held during the past three months, under the co-sponsorship of Servel and the American Gas Association. At these meetings gas industry executives were introduced to the Servel Salesman Selection Plan, which has been officially adopted as one step in the four-point A. G. A. national plan for the selection and training of gas appliance salesmen.

Sales Executives Trained

The second step will be the clinic training sessions, where small groups of sales executives will receive not only the tools to help them select the best available salesmen in their own particular areas, but will also give them the knowledge to effectively put these tools to work. During every clinic each sales manager attending will have the opportunity to try out what he learns right at the session. At the present time more than 100 gas companies, representing more than 9,000,000 domestic gas meters, have already registered for attendance at the clinic session which will be held in all geographical areas.

The presentation of the Salesman Selection Program is divided into two one-day meetings. During the first day people in attendance are given an overall review and discussion of each of the four steps in the selection program. These steps are in turn amplified by the use of sound slide films that point out the failures of "Hunch Hiring" and the strong points of the Patterned Interview System.

The second day of the clinic is used to put into practice the principles that have been covered in the first day of the meeting. Following a quick review of the Patterned Interview, the people in attendance at the clinic are divided into pairs and each goes through the process of being interviewed and giving the interview; using for this purpose standard case histories so that after each practice session comparisons can be made by the entire group.

Gilbert Schade of the Sales Promotion Department of Servel was the instructor for the Detroit session, and in his introduction he pointed out how in the development of the program, Servel studied prewar experience of fifty-eight operating gas companies located in metropolitan areas such as Boston, Brooklyn and Washington; middle-sized cities such as Hartford, Atlanta and Dallas; smaller locations such as Binghamton, N. Y., Cumberland, Md. and Gary, Indiana; and finally small operations such as those at Beaver Falls, Pa. and Goshen, Indiana. This survey represented more than 4,980,000 meters in villages, towns and cities in all geographical areas of the country. In all, the survey covered the records of more than 1,000 gas appliance salesmen.

One of the most important things found during the survey was that 20% of the men who were employed as gas appliance salesmen in the prewar period did 80% of the business. This in itself pointed out the need for a selection program that would raise the general level in men hired in the postwar period to represent the American gas industry as retail appliance salesmen.

From a careful tabulation of the sales records studied, Dr. Robert N. McMurry, noted industrial psychologist and the Servel Sales Promotion staff were able to determine the nine basic personality traits which the unsuccessful salesmen of prewar days lacked and the successful men possessed. These personality traits were found to be stability, industry, ambition, ability to get along with others, loyalty, perseverance, maturity, leadership and motivation.

Therefore, the purpose in the development of the Servel Salesman Selection Program was to design an interviewing procedure which would allow the gas company sales executive better tools with which to select men who possessed the nine basic qualifications of good appliance salesmen.

Group of twenty-two gas company executives from the Michigan Consolidated Gas Company and the Union Gas Company of Canada, Ltd., who attended the Salesman Selection Clinic

In the course of the first day the four component parts of this method of selection were discussed for the men in attendance. The first of these was the Preliminary Screen, which affords an opportunity to eliminate those men who would obviously be unfit. The objective purpose of this preliminary screen is to get rid of these unfit and still retain good will for the company. Following the presentation of the material of the preliminary screen the discussion of it was held, and Newell E. Loomis, merchandise sales manager for the Michigan Consolidated Gas Company, pointed out the importance of retaining the good will of every applicant even though he was obviously unsuited for a job with the company.

"There is one thing that all of us ought to

keep in mind in discussing this preliminary screen", Mr. Loomis said, "and that is that while we are in the position at this stage of separating the wheat from the chaff, in 95% of the cases we will be dealing not only with applicants for jobs, but also with customers of our company. A 'brusque brush-off' at a time like this would do our community relations program no end of harm."

The second step considered at the school was the Weighted Application. This is the only phase of the selection program which is in any way mechanical. To the applicant this form appears to be an average application for employment form, but opposite several of the questions are little squares where the supervisor who first interviews men can insert numerical weights to determine the man's fitness for further interview.

Thus the Weighted Application form is in reality merely a finer screening process to eliminate those men who do not fit in the sales picture of the gas industry.

The numerical weights used for this screen are based entirely on the results of the thousand salesmen survey conducted by Dr. McMurry and Servel. The Weighted Application, while it does serve as a finer screen, makes a time saving contribution to the employer of gas appliance salesmen. It eliminates all but the most promising applicants, thus saving the time of the sales executive who does the final interviewing. It also simplifies clerical work.

In doing the research for the Weighted Application form the Servel survey uncovered seven predictive points about gas appliance salesmen, and it was from these seven points that the Weighted Application form was devised. The first of these was age. Men in the age group from 21 to 40 were those picked as most likely to succeed and thus on the Weighted Application were rated a numerical 4. Those from 41 to 44 have about half as good a chance so they are given two points, while men over 45 are not awarded any points. Total dependents was the second predictive point, and men with 1, 2 or 3 dependents were rated 4. Those with four or more were rated 3, and the man with no dependents, zero.

The number of jobs in the last five years seemed also to be an important factor, and the man who had only had one job received 4 points; two or three jobs was good for 3 points, and four or more rated zero. Time unemployed in the last five years was found to have some bearing, and the man who was never unemployed was given two points, while the man who was unemployed for any length of time received none. The same rating was laid out for present employment; the applicant receiving two points for being employed and none for being unemployed.

Marital status was also considered; the applicant who was single, married or widowed received 4 points, while the divorced or separated applicant received none.

The last of the seven points is relative to savings or investments. A man with savings receives four points and a man without receives none.

Thus, after the applicant has filled in the Weighted Application form, it is comparatively simple for the initial interviewer to insert these weights and see if the man passes a critical score, which thus far has been set up as 11 points. In a location where many applicants are available this critical score can be raised to be a finer screen, or in a tight manpower market, can be reduced to broaden the number of men available for final interview.

On this same application form work experience is covered and from this the gas company is given the information necessary for the next step in the selection program, which is the Telephone Check-up.

William Hampton, left, and Wilbert Glines, of Michigan Consolidated Gas Co., Detroit, participate in a clinic practice session

To make full use of both the Weighted Application and the final Patterned Interview, there must be a link between them to help the interviewer get a true picture of the applicant to learn facts which will be helpful in the Patterned Interview. This is also designed to make the typical personal reference unnecessary. To gain those ends the Servel Salesman Selection Program utilitizes a rather new method, which is known as the Telephone or Personal Check-up.

Here again a form has been devised to help the interviewer get the information.

By checking with previous employers it is possible to verify the truthfulness of the applicant's statements and get an insight into his personal habits that will be a guide in conducting the final interview. The main difference in this and prewar forms of hiring is that previous employers of the person are concentrated upon. This form was developed to overcome the functional weaknesses in the usual method of checking references. Many people are reluctant to put in writing an opinion about another person, and it has been found that men will often say things on the telephone or during a personal interview that they would not put in letters.

Telephone Check-up

In this program nine points are covered in the telephone check-up to previous employers. These are: Was the man employed? What were the dates of his employment? What was the nature of his work? How much did he earn? Why did he leave? Would you rehire him? Did he have financial or domestic troubles? How were his morals and habits? After such check-up has been made, the person conducting the final interview can compare the information he has received from the personal or telephone check-up with that given by the applicant. This serves to check the accuracy of the applicant's statements on the Weighted Application and as a basis for further questioning on the Patterned Interview.

The Telephone or Personal Check-up caused perhaps more discussion than any other point in the two-day school. Most of the men in attendance from the Michigan Consolidated Gas Company felt that in the Detroit area it would be almost impossible to get the in-

Postwar Kitchen Essentials

● By careful planning many Wisconsin home-makers are meeting their "big four" kitchen needs. For their postwar kitchens they are determined to have not a roomful of streamlined units, but four essentials to easier work: (1) good arrangement of large and small equipment so work can be done in consecutive order; (2) safe, tested hot and cold water supply and sewage disposal; (3) maximum light, both daylight and artificial, and ventilation, and (4) correct working heights for both sitting and standing to prevent fatigue.

Mrs. Margaret McCordic, home management specialist at the University of Wisconsin, reveals that Wisconsin women are already planning "war bond" kitchens with these improvements in mind. They aren't backward about wanting some of the promised equipment to be had in the future, however, for they've listed: Foot-pedaled hot and cold water taps for the sink; refrigerator and stove doors that open with a foot pedal; wood or metal prefabricated cabinet sections with doors that slide up or sidewise; sturdy, slide-out steps built into drawer units so that higher cupboards may be easily and safely reached; larger refrigerators with more space for storing frozen foods, and frozen food lockers.

"A first-floor utility room is one of the musts of many homemakers," Mrs. McCordic states. In addition, listed as essential by the 1,400 Wisconsin women with whom Mrs. McCordic has discussed specific kitchen plans are: Good lighting, pleasant family dining areas, and increased use of laborlighteners. Recent surveys indicate that most women do not expect extreme changes in kitchen equipment, stoves, sinks, refrigerators. Improvements which will probably be found on the first new models are better chipproof enamel, more quiet and smooth operation of moving parts, all-in-one-piece equipment, eliminating dirt-catching cracks.—*Retailing.*

formation by telephone. This is a natural objection, and Dr. McMurry in his development of the entire program found from his survey that the two basic objections to it were that the previous employer is not sure to whom he is talking, or that giving out such information is against his company policy. The first of these objections can be answered by asking him to call back at the gas company, and the second by discussing the situation with the general manager of the concern involved.

Following the further discussion of the form of the Patterned Interview and the nine basic personality traits, a slide film was shown of a typical Patterned Interview and how it should be conducted. In explaining the new Patterned Interview form, it was pointed out that there is very little difference between this and the average prewar interview in the way it's carried on. The only difference is the questions asked each applicant are the same and the answers to the questions are written down by the sales manager during the interview, thus giving him a basis for comparison between potential employees in making the final decision. Basically the rules of good interviewing apply with this form as with any other. The applicant should be put at ease, he should be encouraged to talk, and the interviewer should maintain a non-critical attitude of any information that comes out.

Patterned Interview Form

The Patterned Interview form which was presented to the men attending the clinic is a four-page folder containing 179 questions, broken down into six different sections, covering work experience, schooling, family background, financial situation, domestic and social situation, and health condition. Under almost every question in all sections there is a comment printed in red to aid the interviewer in getting the most from each question asked. For instance, under the question of address, in red there is printed the question, Is this a desirable neighborhood? Too high class? Too cheap? These comments in red help the interviewer to find out if the applicant is giving all the information necessary to determine the potential applicant's possession or lack of possession of the nine basic personality traits which have been found to be essential to success in the gas appliance business.

While many of the questions are the same that would be asked by any interviewer, they are stated and phrased with this idea in mind. In the work experience section with each job the question is asked, Were promotions obtained or raises in pay received? In developing the questionnaire, Dr. McMurry felt that the answer to this question could indicate industry, ambition, perseverance, leadership and motivation. The comment is made in red under the question, Has he made good work progress? Does his experience of the past indicate that he would do so in the future? This same treatment is given to all sections of the Patterned Interview.

E. W. Geddes, sales manager for the Union Gas Company at Sarnia, Ontario, who was in attendance at the school, raised the point that 179 questions might take more time than the average interview. In the discussion that followed it was brought out that while the Patterned Interview contained a great many questions, the answers to some of them obviated the need for asking others, and also the Patterned Interview held both the applicant and interviewer so much on the problem at hand with so little wandering, that the whole job was done in a shorter period of time.

The second day of the training clinic on salesman selection opened with a quiz covering the work of the day before. In this quiz 18 multiple-choice questions were asked and each man graded his own paper in the discussion that followed, to see how much had been gained from the work already covered. Following this the instructor of the group discussed the interpretation of the Patterned Interview form from the standpoint of just what the information contained meant.

It was explained that as well as uncovering the man's possession of the nine basic personality traits of industry, ambition, perseverance, loyalty, motivation, maturity, stability, leadership and ability to get along with others, the Patterned Interview form would also uncover certain undesirable traits. It allows the interviewer to consider the frequency of job changes made by the applicant, rather doubtful domestic relations, poor health record, evidences of insincerity, or other things that would make a man undesirable as an employee of the gas company and not a success as a gas appliance salesman. Following this the group analyzed the Patterned Interview questionnaire to determine just what questions or parts of questions indicated the personality traits that were sought after.

The majority of the balance of the second day was spent in practice sessions. It was rather interesting how these sessions worked out. In each session the men broke into pairs; one was the applicant and the other did the interviewing. To make it possible to have a standard procedure, the instructor passed out case histories, the personality of which was assumed by the applicant. In the practice sessions there were covered hypothetical case histories of men who were unfit for the position, borderline cases, and top grade salesmen. After each practice session a discussion was held as to the decision made by the men and an interpretation of the interview that they had taken.

The last section of the two-day training clinic was devoted to a discussion of recruitment of job applicants. It was pointed out that the entire program of salesman selection would be ineffective unless a sufficient number of men applied for the job of gas appliance salesman.

In making the initial survey for the Salesman Selection Plan it was found that in order to get five good gas appliance salesmen, twenty-five applicants have to be recruited.

Servel has laid out a five-point program of recruitment; first is the appointment of a recruitment supervisor; second is the preparation of an easel and background newspaper advertisements; third is the development of an opportunity folder to show to prospective employees; fourth is the conducting of periodical recruitment activities; and the last point is conducting continuous activities which will bring a regular flow of good applicants to the gas company.

At the close of the two-day session, Ira J. Rapson, in charge of domestic sales of the Michigan Consolidated Gas Company in Detroit, said he felt the program would do a great deal to coordinate selection procedures in his company.

"I can see in the Servel Salesman Selection Program," Mr. Rapson said, "possibilities for streamlining our selection processes in the postwar period. I feel sure that it will be of great value to us."

HOME SERVICE CONTEST ON WATER HEATING

A CONTEST open to all home service personnel in this country and Canada for the best paper on "What Home Service Can Do To Aggressively Promote Adequate Gas Water Heating Service" has been announced by the Water Heating Committee of the American Gas Association, C. S. Stackpole, chairman. A first prize of $150 in war bonds will be presented to the winner of the contest which closes May 31, 1945. Other awards, all in war bonds, will be made as follows: second prize, $75; third prize, $50; fourth prize, $25; fifth prize, $25. In addition, where a member of a home service department with a supervisory director wins a prize, the director will receive a special award of a $25 bond.

The committee is asking for specific ideas, such as lecture, demonstration or home call technique, and cautions against generalizations. There is no limit to the number of words and illustrative material, such as pictures, cartoons, props, distribution pieces, etc., which may be used.

Contest rules call for entries to be typewritten on one side of the paper, preferably double spaced. The contestant's name, address, company, and the name of her supervisory director, if any, is to be submitted on a separate sheet accompanying the entry. The contestant's name should not appear on the entry.

Judges of the contest are Ada Bessie Swann, consultant, Woman's Home Companion, New York; Norman J. Radder, secretary, Plumbing and Heating Industries Bureau, Chicago; and M. M. Scott, Advertising Department, Ruud Manufacturing Company, Pittsburgh.

A. G. A. Gas Sales Training Course Now in Production

COPIES of a brochure entitled "For Greater Postwar Sales," announcing the new Sales Training Program sponsored by the Committee on the Selection and Training of Sales Personnel of the Residential Gas Section, American Gas Association, has been distributed to gas companies. This brochure includes full information and details regarding the two courses: (1) Indoctrination (Gas Fundamentals), and (2) Residential Gas Salesmanship.

A series of regional meetings were held recently in various parts of the country at which the Salesmen Selection Program prepared by Servel, Inc., made available to the committee, and the Sales Training Programs were discussed. Similar meetings are now being conducted by Servel on the Selection phase of the program. (See detailed story on adjacent pages.) In view of the intense interest in these courses and in light of current conditions, it has been decided to proceed immediately with the production of the Basic Indoctrination (Gas Fundamentals) Course for use by gas company salesmen and other company personnel so that it will be available to the industry in July, 1945. It is planned to produce the Gas Salesmanship Course so that it wil be available to the industry early in January, 1946.

So that the courses will include the latest and most up-to-date information, members of the Editorial Staff of Trade Ways, Inc., who will prepare the courses, are now surveying the various branches of the gas industry.

The Gas Fundamentals Course is organized in three sections or units, and include the following:

Unit I: Gas—the Fuel
Unit II: Gas—The Service
Unit III: Building the Gas Load

The training course in Residential Gas Salesmanship is organized in six sections or units, and includes the following:

Unit I: Win Confidence Quickly
Unit II: Sell the Service
Unit III: Show and Explain
Unit IV: Complete the Sale
Unit V: Close the Hard Ones
Unit VI: Plan for More Sales

The price of the Basic Group Training Unit (for 10 salesmen) including the Gas Fundamentals of the Gas Industry, and Residential Gas Salesmanship, comprising one complete set of sound slide films (18 films), one set of leader's guides, and ten sets of sales cases, voting sheets and texts for each of the two courses, is $300.

The cost of the course in Residential Gas Salesmanship (for 10 salesmen) comprising one set of sound slide films (12 films), one set of leader's guides, 10 sets of sales cases, voting sheets and texts for the single course, is $200.

The cost of the course in Fundamentals of the Gas Industry (for 10 salesmen) comprising one set of sound slide films (6 films), one set of leader's guides, and 10 sets of sales cases, voting sheets and texts for the single course is $100.

The cost of additional enrollments comprising one set of sales cases, voting sheets, and texts for each of the two courses—Fundamentals of the Gas Industry and Residential Gas Salesmanship—is $15.00 per enrollment. Additional enrollments for Residental Gas Salesmanship is $10.00 and for Fundamentals of the Gas Industry $5.00.

To date, 95 gas utility companies have signified their intention of participating in the program. Complete information and details are available upon request to R. E. Williams, Chairman of the Committee on the Selection and Training of Sales Personnel.

Honeywell Training Schools Open May 1

FOLLOWING a year's research work and preparation, Minneapolis-Honeywell Regulator Company will open a nationwide school May 1 to train dealers, wholesalers, ex-servicemen, manufacturers, electricians, steamfitters, and others in all phases of installing and servicing heating equipment.

The courses, to be held at company branches wherever a sufficient number of people enroll, include four meetings of two and a half hours each. More than 800 slides —divided about equally between photographs and charts or diagrams—will be used to supplement lectures. Twenty-one sets of the slides have been prepared.

Primary purpose of the program is to teach the application of automatic controls and their installation and maintenance in connection with all types of heating systems using all kinds of fuel. The information to be covered has been divided into nineteen subjects with plans to cover several phases in each meeting. Subjects to be discussed are: control identification, circuits, thermostats, thermostat installation, limit controls, relays, controls for oil burners, summer-winter systems, oil burner systems, gas burner control systems, stoker systems, hand-fired systems, unit heater systems, zone controls, Weatherstat systems, Moduflow, and installation helps and service tips.

There is great need for an integrated educational program in the automatic heating industry now, according to Arnold Michelson, vice-president. "We believe," he says, "that all of those in the field will be anxious to catch up with new developments and learn proper installation and service methods."

Pointing out the extreme urgency of a course of this nature, Mr. Michelson stated that today there are only 5,000 oil burner service men in the United States as compared with approximately 30,000 before the war. At the same time, he said, there are fewer than 8,000 stoker service men today against a prewar figure of more than 12,000, and the average gas utility personnel has been reduced from 33 to 40 per cent because of the war, he stated.

The educational program is said to be the largest ever undertaken in the heating industry.

Colored Pennants Effective in Food Displays

This set of six "Can More" pennants are available to gas companies through the A. G. A. Window and Store Display Committee, George W. Browne, chairman. They make effective and colorful additions to nutrition booth trims, Victory Garden, Food Conservation and Canning displays. Each pennant is 13" x 19" and is silk screened in eight brilliant colors on heavy bond paper. Prices are: 1 to 5 sets, $3.00 per set; 5 to 10 sets, $2.75 per set; 10 to 25 sets, $2.50 per set; 25 to 50 sets, $2.10 per set; and so on down to $1.00 per set for 100 or more. Orders should be addressed to Howell Brothers, 24 Beechwood Road, Summit, N. J.

Natural Gas in Europe

FOREIGN Commerce Weekly reports that many European countries are developing natural gas resources in an attempt to relieve the fuel situation and provide raw materials for industry. Rumania and Poland formerly were the only important natural gas producers in Europe, but in recent years Hungary, Austria, Germany and Italy have developed a reasonably large production, while several other countries have made some progress. It is believed that Europe has many still undeveloped sources of natural gas.

The Plus and Minus of Induction Heating

BY W. WIRT YOUNG

W. Wirt Young & Associates, Waterbury, Conn.

W. Wirt Young

IF you heard of a way to get top heat in a matter of seconds instead of minutes or hours .... and control that heat with a flick of the switch .... and place that heat precisely where you want it and no where else, so that the material stays cool .... to get *extra* hardness, with *perfect* uniformity, and with no cleaning or straightening operations afterward .... and all this at lower production cost, you'd want to know all about it in a hurry! Yet all this and more is what you get with High Frequency Induction Heating." The above prescription for curing all heat-treater's ills constituted the opening paragraph in a recent advertising letter on induction heating.

The late Will Rogers once remarked, "It ain't that the public don't know nothin'; but that it knows so many things that ain't so." There is no question that induction heating has a field which, at the present state of development, is somewhat limited. There is no question that its present field has been enthusiastically over-rated. Advertising and salesmanship have convinced many of our customers that it will do things that "ain't so."

Before we discuss competing with high frequency induction heating, we should first take the time to briefly describe the process.

Induction Heating

The piece to be heated is placed in a set of inductor coils; there is no electrical connection between these and the piece to be heated. High frequency alternating current is applied to the coils. Just as a compass needle points to the magnetic North and South Poles by means of an invisible force, so is the piece affected. Instead of the invisible force being steady, it is rapidly changing. This phenomenon induces circulating amperes of high frequency electricity in the piece, as well as various molecular-friction effects. The result is heat in the piece. The degree of heat, and the speed of heating depend upon the power supplied to the inductor coils, the size of the piece, the temperature of the circulating atmosphere, and the frequency of the applied energy.

There are in general three types of modern high frequency equipment.*

(1) Motor-generator sets running approximately 2,000 to 12,000 cycles.

(2) Spark gas sets running approximately 100,000 to 400,000 cycles.

(3) Vacuum tube sets running approximately 300,000 to 15,000,000 cycles.

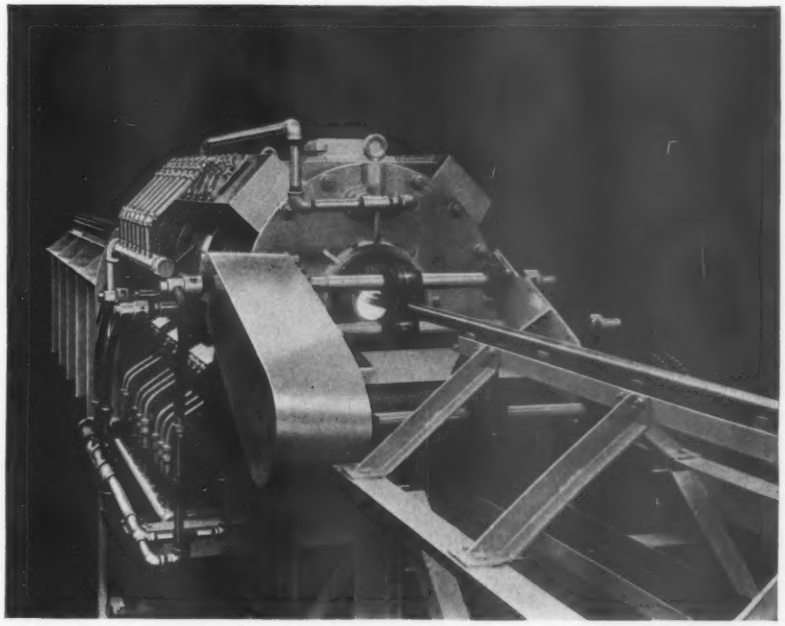
Motor-Generator Units

The motor-generator set is the most popular type of equipment because of its simplicity and dependability. It is simple to maintain, can be properly balanced on three-phase power facilities, and is readily protected from overload. It operates at a relatively high efficiency, generally around 70%. It is probably the best overall type of equipment for heating solid or hollow steel pieces from a foot or more in diameter down to about ½" in diameter.

Spark Gap Units

In the spark gap sets single-phase power generally at 220 volts is applied to the primary side of the transformer. From the secondary side a voltage of 13,000 volts is produced for purposes of discharge across a series of .003" to .004" spark gaps. Proper adjustment of the gaps is very important in the operation of this type of equipment. In the larger models there are approximately 72 gaps whose spacing must be held closely within the above .001" tolerance. This means frequent interruptions and high maintenance costs.

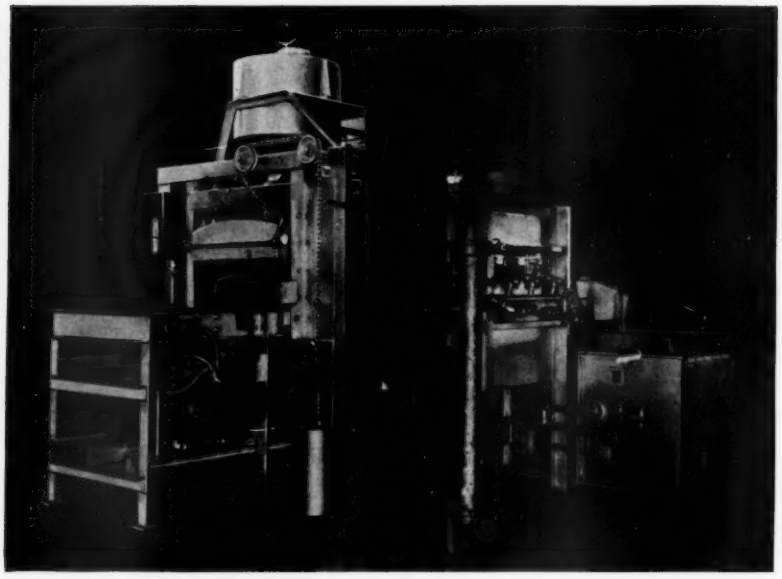
13,000 volts can be dangerous if improp-



Continuous straight through hell-hole annealer through which non-ferrous solid rod is heat-treated at production rates of from 2 to 23 lineal ft. per min. Induction heating could do the job but at greater operating and maintenance costs (Selas photo)

Prepared for presentation at 1945 A. G. A. Conference on Industrial and Commercial Gas.

* For those desiring complete technical information on induction heating we refer you to "High Frequency Induction Heating", by F. W. Curtis, published by McGraw-Hill.



Small gas-fired austempering furnace installed at Shoe Form Co., Auburn, N. Y. "Charmo" atmosphere used for scale free hardening. Work is rapidly quenched into gas-fired salt bath

erly handled or repaired. Spark gap sets must be kept cleaned, and are primarily a piece of laboratory equipment. They should be properly vented to carry away the ozone resulting from the gaps, and the atmosphere must be maintained clear of acid or other fumes, and no dust or moisture should exist in the area. Otherwise frequent breakdowns will occur. Power input is limited to about 30 kilowatts, and the efficiency in this type of equipment is only about 50%.

Vacuum Tube Units

Vacuum tube or electronic sets comprise the most modern development of induction heating. In this type of unit, single phase power is supplied to the primary of the transformer where the voltage is stepped up to 1,500 to 10,000 volts or more. This high voltage is rectified and applied to oscillator tubes to produce the high frequency current at the outlet end of the oscillator. Essentially, electronic high frequency equipment is similar to a standard radio broadcasting oscillator. The large air or water-cooled rectifier and oscillator vacuum tubes are of glass construction with metallic or ceramic bases and supports. This equipment should be completely free from shop vibration, dust, moist air, and acid fumes which are deleterious to vacuum tubes, and high voltage insulation.

The efficiency of vacuum tube sets is not over 50% and tends to decrease as the frequency increases. This type of equipment is generally used for very small pieces, or very thin sections. At the present time, the military has first call on vacuum tubes, which is apt to make it difficult to obtain replacements.

From the above general discussion, we shall assume, in the present state of development, that the spark gap equipment is confined primarily to laboratory and experimental work, and that vacuum tube equipment has its main advantages only on small piece operations which in general are not too serious competition in the heat-treating field. Consequently, we shall confine our discussion to competing with the more popular motor-generator type of high frequency heating.

High frequency heating is not well adapted to any heat treating where the entire piece has to be heated. This type of heating can generally be done more economically in furnace equipment. High frequency heating is not readily flexible. Consequently, it is difficult to use where each piece has a different shape such as in tool hardening, or where alloys are frequently changed. Recently, one of the large brass companies investigated the possibility of using induction heating for slugs prior to hot forging. Their main reason for eliminating the use of this type of equipment was because they forge scores of different types of alloys, and each alloy change meant adjusting the equipment.

The primary present applications of high frequency heating are on intermediate production runs, particularly for selective heat treating. The gas industry already has most of the competitive tools to compete with induction heating. Some of these are still in the state of development, the same as induction heating.

Isothermal Quenching*

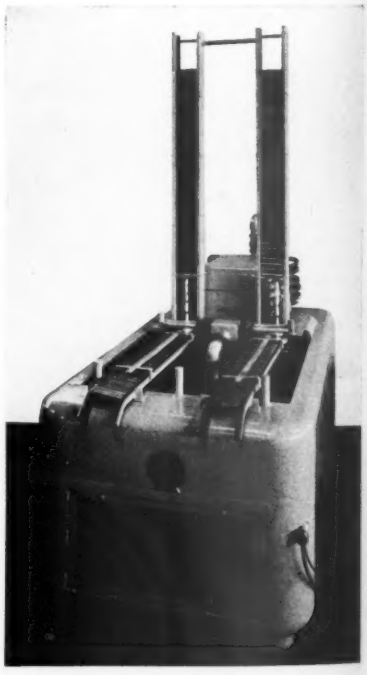
Isothermal quenching, including austempering and martempering, answers many of the problems of partial hardening. The primary reason for partial hardening has been to obtain hardness on that portion of a piece which was subject to wear and still maintain toughness in the balance of the piece. With isothermal quenching, we can heat, and salt quench the entire piece obtaining a hard surface combined with a tough piece, which is not brittle. In general, a better finished piece can be obtained with this method than with partial hardening.

High Speed Gas Heating

High speed gas heating, or flame heating, has been extensively discussed in recent papers and publications of the American Gas Association. It can be generally used for the same type of applications as induction heating and in most cases has a number of advantages including lower installation cost, lower operating cost, and less maintenance. It is not subject to the mass limitations as is high frequency heating. For instance, 25-ton rolls have been satisfactorily surface hardened with gas flame heating equipment, which type of job would be economically impossible with high frequency.

Controlled Atmospheres

The science of heat treating with controlled atmospheres is far ahead of high frequency heating as evidenced by the enormous tonnage of metals being processed with this type of equipment compared with the induction type. Many operations which are now done by high frequency heating, or which our customers contemplate doing with high frequency heating, can be done better and cheaper in controlled atmosphere gas furnaces.



Gas-heated unit for hardening nibs for 30-caliber carbine—at rate of 7,200 pieces per hr.

*For further information refer to "'Interrupted' Quenching in Salt Baths" by Arnold P. Seasholtz—Metal Progress Oct. 1944.

Carbon Restoration*

Carbon restoration, or "Skin Recovery", is a relatively new development in which an atmosphere furnace is used to restore the carbon in the outer decarburized surface of the steel. In some cases this process can be used as an economical method in competition where it is claimed that the speed of high frequency decreases decarburization.

General Comments

(1) Many companies have purchased high frequency equipment where it was not economically justified, before the gas company was aware of the customer's interest. This has been due to the elaborate and successful promotional efforts of the electrical industry, and a lack of proper coverage by the gas industry, due primarily to the manpower shortage caused by the war.

(2) A great deal of induction heating equipment has been purchased with government money by companies who would find it difficult to justify, if spending their own money.

(3) Many engineers in the gas industry have assumed that the only way they could compete with induction heating was with flame heating. In numerous cases this is true, and in such cases this tool should be used. However, there are many instances where induction heating has won out over flame heating, where properly engineered gas furnace equipment could have obtained the business. Most gas engineers have fully appreciated this. As an example, take the mouth annealing of shell cases. The induction heating people went after this very strongly when the war came on. They were able to do a reasonably good job. However, the gas industry proved to most plants that this operation could be done better and much cheaper with the use of gas-fired salt baths.

Summary

(1) Induction heating can perform no miracles, and it is not as trouble-free as it appears.

(2) The gas industry already has the tools to combat induction competition, and these tools are continually being further developed.

(3) For most processes these tools properly applied are economically sound.

(4) The tools can only be successful when backed by adequate promotional effort.

*See "Skin Recovery for Decarburized Steel Surfaces" by Orville E. Cullen, Metals and Alloys, October, 1944.

Commercial Cooking Equipment Production

TOTAL production of 96,192 units of all types of commercial cooking and food warming equipment during 1944 was a fraction of one per cent higher than base period (1941) production, members of the Commercial Cooking and Food Warming Equipment Industry Advisory Committee were told at a recent meeting with War Production Board officials.

AMERICAN GAS ASSOCIATION

INDUSTRIAL AND COMMERCIAL GAS

ADVERTISING FOR MAY

The National Advertising Committee of the Industrial and Commercial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announces that full page advertisements will appear in the trade and business magazines listed below during the month of May. These advertisements are prepared in cooperation with the Committee on National Advertising as part of the industry's national advertising campaign.

GENERAL MANUFACTURING

Automatic precision control influenced Ault & Wiborg Engineers to choose *GAS*.

BUSINESS WEEK (May 19—2/3 page)
MODERN INDUSTRY (1/2 page)

All-Purpose Bombs roll off the line Fast with *GAS*.

INDUSTRIAL HEATING

METALS INDUSTRY

For a head start on the field . . . Plan on *GAS* when Re-converting.

FOUNDRY

All-Purpose Bombs roll off the line Fast with *GAS*.

THE IRON AGE (May 3)
METALS AND ALLOYS
METAL PROGRESS
STEEL (May 28)

TECHNICAL COLLEGE PUBLICATIONS

How *GAS* advances the science of heat treating.

ENGINEERING COLLEGE MAGAZINES (32)

CERAMIC INDUSTRY

Drying Ceramic Coated Welding Rods In *GAS* Furnace triples production—cuts cost—reduces rejects. CERAMIC INDUSTRY

GLASS INDUSTRY

Back of the Nation's production miracle . . . *GAS* Research.

GLASS INDUSTRY

CHEMICAL FIELD

Drying Ceramic Coated Welding Rods In *GAS* Furnace triples production—cuts cost—reduces rejects.

CHEMICAL & METALLURGICAL ENGINEERING

World's Largest Producer of Penicillin uses *GAS* for important operation. CHEMICAL AND ENGINEERING NEWS (May 10)

HOTEL AND RESTAURANT FIELD

70 Year Old Durgin-Park Restaurant of Boston finds *GAS* speeds service, eliminates waste, provides greater cleanliness.

AMERICAN RESTAURANT

Manager of Hotel Nicollet praises Economy and Efficiency of New *GAS* Equipment. HOTEL MANAGEMENT

Nearly 3 million meals a year in this restaurant are cooked with *GAS*.

RESTAURANT MANAGEMENT

Hospitals' Official Praises Results since switching to *GAS*.

INSTITUTIONS

SCHOOL FIELD

Better cooking and baking results today and tomorrow . . . through *GAS* Research. NATION'S SCHOOLS

HOSPITAL FIELD

Pittsburgh's Famous Presbyterian Hospital Proud of Its *GAS* Kitchens.

MODERN HOSPITAL

FOOD PROCESSING

World Famous Biscuit House Chooses *GAS* for trouble-free operation and dependability. FOOD INDUSTRIES

BAKING FIELD

St. Moritz Hotel chooses *GAS* to bake its famous pastries.

BAKERS' HELPER (May 5)
BAKERS WEEKLY (May 28)

World Famous Biscuit House Chooses *GAS* for trouble-free operation and dependability.

BAKERS' HELPER (May 19)
BAKERS WEEKLY (May 7)

Technical Section

Experience with Generator Connections

A major trouble experienced by water gas companies during the past severe winter was the failure of the generator off-take lines, causing shut-downs and necessitating repairs. As this failure is difficult to forecast, it has caused many inconveniences and, in some cases, serious failures. Herewith the MONTHLY presents reports of two companies who apparently have found a solution to this problem.

NORWALK PLANT—CONNECTICUT LIGHT & POWER CO.

BY GEORGE PEARL

THE connections on the Norwalk sets were originally side outlet cast iron tees filled with sectional lining brick segments. The failure of these linings caused casting failures and these tees were replaced with welded steel connections with relieved corners. The refractory lining of these steel tees was cast in the connection to a thickness of five inches.

The above changes improved performance to a slight degree but failure of the lining in this connection was a limiting factor in set operation.

A silicon carbide lining was installed in this tee in 1942. After 9000 hours of service very slight amount of deterioration has taken place and the lining should last indefinitely.

The silicon carbide lining material installed was not specially designed for this service. The lining consists of pit furnace lining sections 1¾" thick and soap shapes cemented in place by silicon carbide cement. The insulation between silicon carbide and steel tee is the cast refractory lining cut to provide a slide fit between it and the lining segments.

The installations in the tees at Norwalk are definitely homemade in that they are an application of available shapes and materials to the job by John Miller of Norwalk, and John King of the Carborundum Company.

ASTORIA PLANT—CONSOLIDATED EDISON CO. OF N. Y., INC.

BY GEORGE L. BIXBY

AT the present time the Astoria Plant is in the home stretch of the biggest winter in its history. In the past this season of the year has been characterized by the juggling of a number of generator sets in the hope that they might somehow manage to last until the load dropped off. This has been particularly true of the twelve Williamson sets in the "C" Generator House. They are normally overhauled during the summer, and in March they were usually all of approximately the same age, and two or three were certain to be in a distressed condition. There used to be several causes for this distress but they have been eliminated gradually until in the last few years only one has remained. This last has been jocularly designated the "Hot Spot Department." It is evidenced by small red-hot areas on the surface of the hydrogen main which connects the generator with the carburetter. These are divided into three categories:

1. Those which appear only during the clean.
2. Those which appear at each coal-up.
3. These which appear every blow.

These last are critical as the metal will crack or burn through if they are neglected. All are caused by failure of the refractory lining. This year, after breaking all our production records several times, we have only one set with a "hot spot" and it is but Class 1 at that.

This is indeed a remarkable improvement. It has been accomplished by eliminating sharp changes in direction-of-flow of the gas where this was feasible and by lining the areas of impact in the main with Silicon Carbide Shapes where it was not. The former method was employed first, as it could be done with materials which were already at hand. It was very successful in the case of the dust pocket connection. The dust pocket was filled with fine ashes and the upper part, which carries the gas around a 79° turn from the generator to the upper hot valve, was lined as a 30" I. D. elbow. This installation had a life in excess of 4,000 operating hours which is the normal winter's run with the Williamson machines. The former design seldom lasted much more than 1,500 hours due to erosion caused by the impact of the entrained dust in the gases.

Similar efforts to prolong the life of the lining in the steel tee, which carries the gas from the upper hot valve into the hydrogen main, were a notable failure. The lining in this 38" tee was 4" thick and seldom lasted more than 1,000 operating hours. Efforts to make the interior resemble an elbow did prolong its life but it was almost impossible to install such an arrangement without deflecting gas stream to one side or the other of the hydrogen main. This resulted in one side of the lining of the hydrogen main being chewed out above the steel tee and, as this was a relatively inaccessible spot in which to effect a repair, more harm was done than good.

This course was abandoned therefore and in October, 1943, a test installation was made of "Carbofrax" ring tile 1¾" thick backed up with 2½" "Infrex" insulating brick. This was a small patch about 3 ft. square and covered the area which had proved most vulnerable in the past. The fire clay blocks adjacent to it have failed several times during the 5,430 operating hours elapsing from the time of its installation until the time of our last inspection of February 9, 1945. At that time no appreciable wear or erosion was evident in the "Carbofrax" tile.

Various other silicon carbide mixes have been experimented with during the past year:

1. An installation of 72% silicon carbide ring tile was inspected on March 14, 1945 after 2,750 operating hours. It has been eroded to a depth of about ½" in the area of maximum impact. It also shows some crazing.

2. A similar installation of 50% silicon carbide, 50% sillimanite ring tile was inspected in December, 1944 after 1,148 hours of operation. At that time considerable crazing was evident and this lining did not appear to be in as good condition as the 72% tile which were inspected the following week after 1,549 operating hours.

3. On March 17, 1944, 50% silicon carbide ring tile were installed in another set in the same location. After 370 hours of operation these tile were badly honey-combed, the lower course had sagged away and the

Contributed by

WATER GAS SUBCOMMITTEE

J. HAWLEY TAUSSIG, *Chairman*

upper course had fallen out altogether. The remaining tile were removed and the standard fire clay shapes were substituted for them.

As a result of the above experiences we have been convinced of the advisability of using "Carbofrax" or 85% silicon carbide blocks in this and similar locations. We have altered our drawings to permit the use of 2" thick blocks backed up with 2" insulating brick of the Sil-O-Cel type. The newly-designed blocks are of larger size however in order to reduce the number of joints and so they may more nearly conform with the fire clay shapes formerly in use thus eliminating cutting of the adjacent lining blocks during installation. Our intention is to completely cover the backs of the dust pocket connection, steel tee, and carburetter tee with this material, also the top of the hydrogen main elbow. The long-sweep construction in the interior of the dust pocket connection we intend to retain but we hope to further minimize repairs to it by using silicon carbide blocks in the outer side or back of the sweep.

None of these erosion difficulties have been experienced with the generator-carburetter connections in the "D" water gas sets. Since these connections are of a straight tangential type, the gases pass straight through and repairs to the 6" fire clay lining have been of a minor nature. Frequently none were made at all after a 4,500-hour period of operation. The oldest lining has been in service for 19,920 hours and dates from the time the tangential connection was first installed as do all the others. Their appearance indicates that they will last indefinitely.

Concurrently with the use of silicon carbide material in the "C" generator sets, we have been experimenting with silicon carbide blocks in the tee connecting the boiler valve of the "D" water gas sets with the waste heat boiler. This tee is of 42" diameter and is lined to 36". In its original design this lining did not begin to approach in length of service the 2,000 hours which elapsed between scheduled overhaulings of the sets. The brickwork was accordingly redesigned to make the interior resemble a longsweep elbow. This resulted in an increased life varying from 1,441 hours to 2,397 hours of operation to quote actual figures.

The material used at that time was nonabrasive fire-clay and steel mix fire clay. Lining thicknesses up to 4½" were also tried without much success. With the installation of back run and marginal blast on these sets the running time between overhaul's was extended to 4,500 operating hours and the limited life of this lining again became the determining factor in our ability to keep the sets in operation. 50% silicon carbide and 72% silicon carbide blocks were then installed. Both were 2" thick and backed up with 1" insulating splits. It was hoped that these would prove satisfactory inasmuch as the temperatures found in this connection are seldom in excess of 1,250° F. as indicated on a recording pyrometer.

The 50% silicon carbide blocks proved somewhat disappointing. Considerable crazing was evident and their use was abandoned. The 72" silicon carbide shapes proved quite satisfactory to date and we have two sets which have operated 4,445 and 4,561 hours respectively and at the end of that time required the replacement of but two or three blocks. These blocks were in a position which would not have impaired further operation. The 72% blocks showed some crazing but little wear. However we propose to use 85% silicon carbide material in all future installations. The difference in price is so small that it seems worthwhile insurance against the eventual failure of the 72% blocks due to crazing and cracking of the material.

We feel that the conclusions we have arrived at in regard to the use of silicon carbide blocks in these locations are thoroughly justified. The 24 water gas sets at Astoria have been operated under the most severe conditions during the past two years. Nineteen sets have been kept in almost continuous operation during the months of November, December, January, February and March; and a year-round average would show 9 sets operating 24 hours per day in the "D" generator house. As a result we have been able to accumulate a wealth of information in a relatively short time. Our conclusions are in no way affected by lack of ability to make adequate lining repairs. We have a well-organized and thoroughly competent mason gang. To us the use of silicon carbide material is vital in that it permits us to dovetail lining repairs with our regular overhaul schedule.

BOOK REVIEW

"State Regulations Pertaining to the Heating Value of Gas as of June, 1944" Publication No. TM 17

Compiled by Cutler-Hammer, Inc., Milwaukee, Wisc.

In 1934 the Bureau of Standards published Circular No. 405 entitled, "Standards for Gas Service." This circular tabulated information obtained from various State Commissions on regulations pertaining to the heating value of gas. Since this information is over ten years old, Cutler-Hammer, Inc. as a result of numerous requests saw a need for compiling similar but up-to-date data. Letters were sent to forty eight State Commissions by C. S. Pinkerton, manager, public works and utilities sales, and information asked for is listed as follows:

a. Method of determination of B.t.u.
b. Location or operation of B.t.u. testing stations
c. Maximum or minimum B.t.u. limitations
d. Rate structure if B.t.u. is involved
e. Penalty or bonus based on B.t.u.

Replies received number forty three and included, for the most part, copies of the state rules and regulations pertaining to gas utilities. Both the letters and rules were reproduced in the compilation reviewed and make interesting reading.

The booklet also contains (1) a graph showing the distribution by states of C-H Recording Calorimeters, (2) an analysis of information received from State Commissions, (3) Bulletin 16310 C-H Recording Calorimeter—Type AB, (4) Bulletin 16340 "Cutler-Hammer Thermometer" and (5) Bulletin 16380 "Calorimixer for Gas Mixing Control."

The reviewer recommends very highly the Cutler-Hammer compilation of recent, informative facts on state regulations pertaining to the heating value of gas.

S. W. MARTIN, *Chairman*, Subcommittee on Analyses and Tests

"Wrinkles" Report Approved

THE 1944 Wrinkles Report prepared by a subcommittee of the Technical Section's Chemical Committee under the chairmanship of W. R. Fraser, Michigan Consolidated Gas Co., Detroit, has been widely commended for its valuable and useful contributions to the gas industry. Typical of comment received is the following excerpt from a letter written March 23, 1945, by Lyman H. Bell, president, The Central West Utility Company, Kansas City, Mo.:

"We feel that the report of the Subcommittee on 'Wrinkles' contains so many excellent ideas and short cuts that we should like to place it in the hands of each of our key field employees.

"We are sincerely grateful for the splendid ideas contained in the report and will look forward to similar reports in the future."

The 1945 report is now being compiled by this year's A. G. A. subcommittee headed by J. Gordon Sweeney.

Convention Calendar

MAY

3 •Indiana Gas Association, Annual Meeting, Indianapolis.

7-11 •National Fire Protection Association, Annual Meeting, Philadelphia, Pa.

16 •Pennsylvania Gas Association, Annual Meeting, Philadelphia, Pa.

18-19 •Gas Meters Association of Florida and Georgia, Spring Meeting, Daytona Beach, Florida.

JUNE

12-14 •Institution of Gas Engineers, Annual Meeting, London, England.

15-16 •Interstate Oil Compact Commission, Oklahoma City, Oklahoma.

19-22 •Canadian Gas Association, Annual Convention, Murray Bay, Quebec.

Affiliated Association Activities

New England Gas Association Elects

D. S. REYNOLDS, vice-president and chief engineer, Boston Consolidated Gas Company, has been elected president of the New England Gas Association for the 1945-46 term. Other officers named by the Association are: first vice-president—L. E. Knowlton, Providence Gas Co.; second vice-president—J. A. Cook, Lynn Gas and Electric Co.; treasurer—E. H. Eacker, vice-president, Boston Consolidated Gas Co. Clark Belden continues as executive secretary and clerk.

Seventeen directors were elected as follows: F. D. Campbell, E. M. Farnsworth, W. G. Jennings, A. V. S. Lindsley, E. C. McGraw, J. H. McPherson, I. L. Moore, A. G. Neal, E. F. Putnam, R. E. Ramsay, J. J. Scott, E. G. Twohey, J. L. Underhill, C. P. Warner, J. A. Weiser, John West and C. G. Young. Ex-officio directors are the two most recent past presidents, Hall M. Henry and N. B. Bertolette, and the division chairmen.

Selected for division chairmen were: Accounting—H. A. Martinson; Industrial—R. C. LeMay; Manufacturers—A. McW. Wolfe; Operating—G. P. Langton; Sales—R. E. Finnin.

Mid-West Gas Association Meets

Burt R. Bay

BURT R. BAY, president of Northern Natural Gas Co., Omaha, Neb., was elected president of the Mid-West Gas Association at the fortieth annual meeting of that organization held May 9 at Omaha. A past chairman of the Natural Gas Department of the American Gas Association, Mr. Bay was chairman of District 2 in the Office of Petroleum Administration for War organization set up by Mr. Ickes to coordinate the natural gas industry's war effort.

Other newly elected officers are: first vice-president—E. C. Deane, district manager, Central Electric and Gas Co., Sioux Falls, S. D.; second vice-president—E. J. Otterbein, sales manager, Iowa-Illinois Gas and Electric Co., Davenport; secretary-treasurer—R. B. Searing, Sioux City Gas and Electric Co., Sioux City, Iowa.

Following a review of the association's activities, C. A. Bland, retiring president, praised the gas industry's war record and called for greater effort to meet the postwar challenge. "The gas industry," he said, "has an opportunity to be a stabilizing influence in the postwar world. It is our duty to continue to give good and courteous service, to recognize our obligation to returning servicemen by giving assistance in rehabilitation and employment, by raising the morale and loyalty of our employees, by having available reliable modern and attractive merchandise, to endeavor to meet competition with lower costs and to encourage new developments in production and appliances. A sincere effort to do all of these will impress and command the respect of our citizens."

Among other speakers were George H. Smith, director, Natural Gas Department, American Gas Association, who discussed the natural gas investigation; C. C. Jolley, personnel director, Natural Gas Pipe Line Co. of America, who described the activities of the Mid-West Personnel Conference; Louis Ruthenburg, president, Servel, Inc., who spoke on all-year gas air conditioning; Lester J. Eck, vice-president, Minneapolis Gas Light Co., and vice-chairman, A. G. A. Technical Section, who reported on the A. G. A. mixed gas research project; and F. H. Andrews, Philgas industrial division manager, whose topic was LP gas utilization.

Affiliated representatives on A. G. A. managing committees were selected as follows: Manufacturers' Section—L. S. Reagan; Technical Section—W. J. Wuestenfeld; Accounting Section—L. M. Spense; Residential Gas Section—A. L. McKinstry; Industrial and Commercial Gas Section—L. Shomaker.

New directors are Mr. Eck; Mark Pendleton, Iowa Public Service Co.; D. A. Powell, Iowa Power & Light Co.; and C. C. Hellmers, Central Electric and Gas Company.

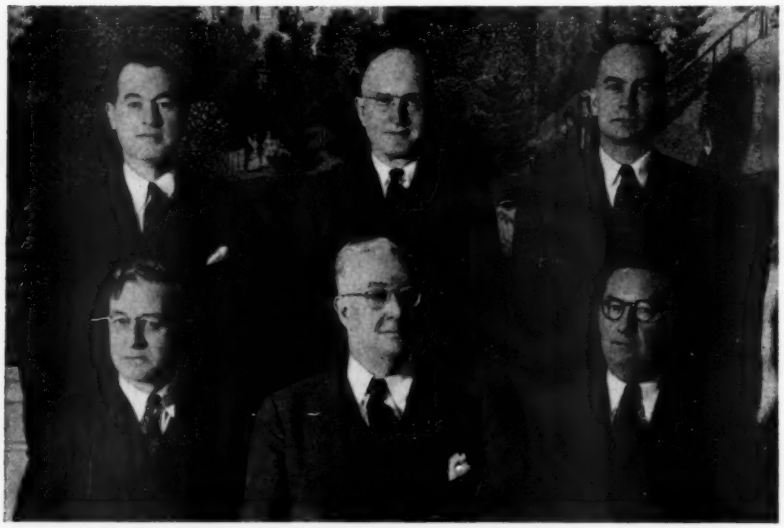
P. C. G. A. Water Heater Council Meets

W. M. Jacobs

SPONSORED by the Sales and Advertising Section of the Pacific Coast Gas Association, of which W. M. Jacobs is chairman, the first Water Heater Council Conference was held February 21 in Los Angeles. Clyde H. Potter, general sales manager, Southern Counties Gas Co., and Claude Ballinger, Republic Heater Co., acted as co-chairmen. Approximately 75 representatives of manufacturers and utility companies attended.

Dual theme of the conference was the proposed Certified Performance Water Heating Program and Postwar Water Heaters. After an extended discussion of the C.P. program, the group went on record as favoring a program to upgrade water heaters and expressed its intention of making concrete proposals to the American Gas Association Committee in charge of the program. It was also decided that no sales promotion should be undertaken until the end of the war.

Discussion of features of postwar water heaters revolved around the published report of the 1944 P.C.G.A. Committee on Postwar Gas Appliances. It was brought out that many improvements in appearance and performance are now being worked out.



1945-46 N.E.G.A. Officers—Front Row (l. to r.) L. E. Knowlton, 1st vice-president; D. S. Reynolds, incoming president; H. M. Henry, retiring president. Rear Row, E. H. Eacker, treasurer; J. A. Cook, 2nd vice-president; Clark Belden, executive secretary and clerk

Personal and Otherwise

New Vice-Presidents of Philadelphia Gas Works

Thomas S. Lever, Jr.

HUDSON W. REED, president of the Philadelphia Gas Works Company, has announced that two members of his staff have been elected vice-presidents of the company.

Thomas S. Lever, Jr. was elected vice-president in charge of accounting. Mr. Lever was born in Philadelphia and entered the employ of The United Gas Improvement Company, then operating the city's gas works, as a junior clerk in February 1903. On May 1, 1933 he was appointed controller of The Philadelphia Gas Works Company.

H. B. Andersen

H. Bruce Andersen, who has charge of the distribution system of the company, was elected vice-president in charge of distribution. Mr. Andersen was born in March 1885 in Philadelphia. He attended Episcopal Academy from which he graduated in 1902, and then the University of Pennsylvania from which he graduated in 1906 as a Mechanical Engineer. He entered the company's employ in July 1906 as street clerk and has been with the gas works ever since.

Both Mr. Lever and Mr. Andersen are active members of the Pennsylvania Gas Association and the American Gas Association. Mr. Lever has served on the Managing Committee of the A. G. A. Accounting Section and participated in many of its activities. Mr. Andersen is a past chairman of the Distribution Committee of the Technical Section and is now chairman of the Subcommittee on Economics of Distribution Design for Domestic Load Building.

Public Service Elects New Officers

George H. Blake

GEORGE H. BLAKE was elected president of Public Service Corporation of New Jersey and subsidiary companies April 17 by the boards of directors of the corporation and subsidiaries at their reorganization meetings in Newark.

Thomas N. McCarter was reelected chairman of the board and Percy S. Young, chairman of the executive committee.

T. N. McCarter, Jr.

Mr. Blake succeeds Edmund W. Wakelee, president since 1939, whose retirement because of illness after many years with Public Service and predecessor companies was announced by Mr. McCarter at the annual meeting of stockholders April 16.

Thomas N. McCarter, Jr. was elected executive vice-president, the post held by Mr. Blake since 1943. For the past six years Mr. McCarter has been vice-president in charge of the company's southern division.

F. A. Lydecker

All other executive officers of the corporation and subsidiary companies were re-elected or reappointed.

Frederick A. Lydecker was named vice-president in charge of gas operation, Public Service Electric and Gas Company, and a director of the corporation's subsidiary companies succeeding John A. Clark who retires. Mr. Lydecker has been assistant vice-president in charge of gas operation and has been prominently identified with American Gas Association activities. He has been either chairman or a member of a number of Technical Section committees and is a past chairman of the Section.

The new president of Public Service, George H. Blake, started with the company in 1910 as a trial attorney in Jersey City. In October 1921 he was promoted to assistant general solicitor and on April 1, 1923 to general solicitor. He was made a director of the corporation in 1934 and a member of the executive committee a year later. Mr. Blake was promoted to vice-president and general solicitor April 20, 1937 and to executive vice-president August 17, 1943.

Thomas N. McCarter, Jr. has been a director of the subsidiary companies of Public Service since 1941 and a director of the corporation since 1943. He is a member of the executive committee. Prior to going to Public Service in 1937 he was vice-president and a director of the Central New York Power Corporation, a subsidiary of Niagara Hudson Power Company of New York.

Frederick A. Lydecker started with Public Service in 1908 as a cadet engineer in the gas department. In 1911 he was made assistant superintendent of the Summit and Morristown gas district and a year later superintendent of that district. He went to Newark as superintendent of gas distribution, Newark district, in 1916 and was made engineer of distribution of Essex Division a year later. In September 1922 he became assistant general superintendent of gas distribution and in 1926 general superintendent. Mr. Lydecker was promoted to assistant vice-president in charge of gas operation April 18 last year. He is a graduate of Stevens Institute of Technology and lives in Glen Ridge.

Retires After 47 Years With Public Service

John A. Clark

AFTER serving more than forty-seven years with Public Service Electric and Gas and predecessor companies, the last nineteen as vice-president in charge of gas operation, John A. Clark retired April 17.

During this long period of service in the gas utility field, Mr. Clark has seen the gas business of Public Service grow from comparative infancy to the second largest gas manufacturing company in the world.

Upon being graduated from Union College in 1895 with a Bachelor of Engineering degree, Mr. Clark started his long service in the gas utility field as an engineer for the East River Gas Company of New York.

He remained with that company and its successor, the New Amsterdam Gas Company, until March 1, 1898, when he went to the Newark Gas Company as superintendent. This company was later merged into the Newark Consolidated Gas Company which was one of the many taken over by Public Service Corporation of New Jersey in 1903.

On March 1, 1899, Mr. Clark became superintendent of distribution of the Orange, Montclair and Summit districts and on November 1, 1908, he was made engineer of distribution of Essex Division, becoming general superintendent of distribution February 1, 1917. He became vice-president in charge of gas operation in 1926.

He is a director of Public Service Electric and Gas Company.

Public Service President Dies After Retirement

E. W. Wakelee

EDMUND W. WAKELEE, president of Public Service Corporation of New Jersey and subsidiary companies, died April 26, just ten days after his retirement was announced on April 16. A former Republican State Committee chairman and formerly president of the State Senate, he had been in poor health for some time.

Mr. Wakelee had been identified with Public Service and predecessor companies since 1900. For more than a quarter of a century he had been an officer of the company and its president since 1939. He had been a vice-president and a director of the corporation and subsidiary companies since 1917 and had headed the law department of Public Service for more than two decades.

Frank S. Kelly Reelected President of S. G. A.

FRANK S. KELLY, industrial engineer for the Arkansas Louisiana Gas Company, was re-elected president of the Southern Gas Association for the 1945-46 year on March 6 at an executive session of the organization held in New Orleans.

The re-election of Mr. Kelly comes as a distinct honor in view of the fact that this is the first time in the history of the organization that a president has been re-elected for the second consecutive term.

Blythe Retires from Missouri Association

Jesse Blythe

AFTER 18 years of service, Jesse Blythe, of Jefferson City, Mo., assistant secretary of the Missouri Association of Public Utilities, will be retired May 1. He is 71 years old. The association has told him he has earned a rest and may dig in the garden, go fishing, or sit in the shade of a friendly tree and watch the world go by.

Mr. Blythe has been with the association since it was established in St. Louis. When the headquarters office was moved to Jefferson City, Mr. Blythe went with it and has remained there ever since.

He helped organize, and worked with, the various committees and activities of the association until it became recognized as one of the outstanding State utility associations. It includes virtually all of the gas, electric, and water companies throughout Missouri in its membership.

A short time ago, William H. Allen became general counsel and managing director of the Missouri association. E. A. Beer, who served as managing director for several years, will continue to be affiliated with that organization.

Pollard Heads P. G. & E. Commercial Department

James F. Pollard

CHANGES among key Pacific Gas and Electric Company men were announced April 1.

Henry Bostwick, manager of the San Francisco division, retired after 41 years of efficient and conscientious service. New division manager in San Francisco is N. R. Sutherland, who has been with the company since 1913 and manager of the commercial department since 1923.

James F. Pollard, formerly in the office of vice-president and executive engineer, will succeed Sutherland as head of the Commercial Department. He had spent several years at Salinas as general manager of the Coast Valleys Gas and Electric Company and three more years as division manager after P. G. and E. took over that company in 1927.

He was president of the Seattle Gas Company from 1930 to the end of 1943 when he returned to P. G. and E.

The cooperative national advertising campaign conducted by the American Gas Association, now in its ninth year, was first proposed by Mr. Pollard in a stirring address during the 1935 A. G. A. convention at Chicago.

Safety Code Committee Elects Douglas

JAMES B. DOUGLAS, manager, Casualty and Insurance Department, The Philadelphia Gas Works Co., was elected vice-chairman of Safety Code Correlating Committee of the American Standards Association at the committee's annual meeting held in New York, March 6. He represents the American Gas Association on the committee.

Mr. Douglas has been active in safety work and in related activities in the public utilities field for many years. He was chairman of the first Accident Prevention Committee of the American Gas Institute, now merged with the American Gas Association. He helped to organize a similar committee of the former National Electric Light Association and was chairman of the Public Utilities Section of the National Safety Council, of which his company was one of the original members. In addition, he is a member of the Management Committee of the Philadelphia Safety Council.

On Advertising Committee

TWO changes in the personnel of the Committee on National Advertising of the American Gas Association are announced by H. Carl Wolf, President, Atlanta Gas Light Company, and Chairman of the Committee:

C. S. Stackpole, manager-merchandising, domestic gas and electric sales, Consolidated Gas Electric Light & Power Co., Baltimore, Md., will represent participating companies in Maryland, District of Columbia, Virginia and Kentucky. He replaces Marcy L. Sperry, president, Washington Gas Light Co., Washington, D. C., who has been a member of the committee since the inception of the national advertising program nine years ago.

H. S. Christman, general sales manager, The Philadelphia Gas Works Co., Philadelphia, Pa., replaces Fred B. Hofft, vice-president, The United Gas Improvement Co., Philadelphia. Mr. Christman represents companies situated in Eastern Pennsylvania and Delaware.

Mr. Stackpole and Mr. Christman were elected to the committee by vote of participating companies in their respective territories.

Winslow to Koppers

RALPH WINSLOW has resigned as director of public relations for Libby-Owens-Ford Glass Company, a post he has held for four years, to become advertising manager of the Koppers Company, Pittsburgh.

Mrs. Matson Takes Home Service Post

Mrs. Fleta Matson

THE Binghamton Gas Works has announced the appointment of Mrs. Fleta H. Matson as home service director, succeeding Mrs. Helen Heiser.

Mrs. Matson is a graduate of the New York State College of Home Economics at Cornell, New York, and has held several teaching posts since that time. The first was at Canastota, New York, followed by similar work in the Medina, New York, schools. Forsaking teaching for a time, Mrs. Matson became assistant home demonstrator for the Adirondack Power and Light Company at Schenectady, and while there, did a weekly program on home economics over WGY.

Going to Johnson City in 1932, Mrs. Matson became a teacher of English and Home Economics in the schools there, a position which she held for 12 years. With food scarcities and the need for nutritional education among housewives, Mrs. Matson accepted the post of emergency assistant home demonstration agent of the Broom County Nutrition Program.

Lone Star Promotes Potter

L. T. POTTER, superintendent of production for Lone Star Gas Co. and Lone Star Producing Co., headquarters in Dallas, Texas, has been assigned the additional duties of assistant general superintendent. Announcement was made by Julian L. Foster, general superintendent and chief engineer of Lone Star.

Mr. Potter has been with Lone Star since June, 1928, following his graduation from Texas A. and M. College where he received his degree in mechanical engineering. He was named chief production engineer in 1939, and production superintendent in 1941.

Mekler Appointed Institute Consultant

L. A. MEKLER, combustion engineer and member of the engineering and development department for Universal Oil Products Company since 1927, has assumed a new position as engineering consultant to the Institute of Gas Technology and the Armour Research Foundation of Illinois Institute of Technology.

An outstanding inventor, author and lecturer on such subjects as combustion, furnaces, petroleum heaters and petroleum refining processes, Mr. Mekler is a naturalized American citizen of Russian extraction, who has lived in the United States for nearly twenty years.

Born in Churnigov, Russia, on July 1, 1894, Mr. Mekler earned his degree as Candidate of Commerce at Harbin, Manchuria, in 1912. He graduated from the University of Glasgow (Scotland) in 1915 with a B.Sc. and received a B.S. in metallurgy from the University of California in 1919.

On leave of absence from April 1942 to November 1943, Mr. Mekler served with the Petroleum Administration for War in Washington.

War Veterans Honored By Brooklyn Union

FIRST of a series of luncheons planned for returning war veterans was held by The Brooklyn Union Gas Company April 10 at the Hotel Bossert. Eighty-four employees, including a Purple Heart veteran, Adolph H. Brunckhorst, Jr., were accorded a warm welcome back to their homes and jobs.

President Clifford E. Paige, in a welcoming address, voiced the company's happiness over their safe return and its satisfaction in seeing them back at work. He said the company is extremely proud of the fine records employees have made in the armed services.

Each veteran was introduced by Secretary Richard B. Loomis to the assemblage, which included company officers and department heads. In the introductions Mr. Loomis noted the ribbons and other decorations won by the employee, the rank he held at the time of his discharge, and in what theatres he served. Included in the group were men who had served in every major theatre except India-Burma and China.

A. G. A. Assistant Treasurer

V. T. Miles, assistant treasurer of the Long Island Lighting Company, Mineola, who was recently elected assistant treasurer of A. G. A.

Tappan Promotes Dysart

RE-ELECTION of the present members of the board of directors and officials of the Tappan Stove company, Mansfield, O., and the promotion of Harold O. Dysart to secretary of the firm, has been announced following the annual meeting of the stockholders and directors. A. C. Rhoads, former secretary-treasurer, will remain as treasurer.

A graduate of Mansfield Senior high school, Dysart has been employed by Tappan's since 1922 and has been assistant secretary since 1934.

Companies Mixed

IN announcing new members of the American Gas Association in the April issue, the MONTHLY listed Charles H. McNulty as being associated with the Southern Counties Gas Co., Los Angeles. This was incorrect as Mr. McNulty is with the Coast Counties Gas & Electric Co., Santa Cruz.

Rohde Rejoins Ruud

G. M. Rohde, Jr.

G. M. ROHDE, JR. has rejoined the Ruud Manufacturing Company, makers of automatic gas water heaters, Pittsburgh, Pa., as assistant to the president, R. H. Lewis.

Mr. Rohde was at one time with the Pennsylvania Power & Light Company as supervisor of gas sales and of the electric range and water heater department. Later he was western manager for Roberts & Mander and following that a member of the Ruud-Monel promotion staff.

When war came, he was loaned to the Training Within Industry Program of the War Manpower Commission and subsequently became associated with the Westinghouse Electric & Manufacturing Company.

Pettyjohn Succeeds Yellott as Director of Institute of Gas Technology

COMDR. ELMER SHAW PETTYJOHN, U.S.N.R., was named director of the Institute of Gas Technology at Illinois Institute of Technology on April 17, succeeding John I. Yellott who has held the post since September 1, 1943.

Until the time when Comdr. Pettyjohn's naval assignment is terminated, Associate Director L. J. Willien will be in charge, according to the announcement by Dr. Henry T. Heald, president of Illinois Tech and the Institute of Gas Technology.

Comdr. Pettyjohn is at present absent from the country as head of the oil section of the United States Strategic Bombing Survey and as liaison in the United States Naval Technical Mission. Extensive experience as a consultant to numerous gas companies has fitted him for the directorship of the Gas Institute.

Born in Alma, Michigan, on April 12, 1897, Comdr. Pettyjohn earned his B.A. at Michigan in 1918, obtaining his B.S.E. and M.S.E. there in 1922. In addition to several years of industrial and research experience, he was an associate professor of chemical engineering at the University of Michigan before joining the armed forces in 1940.

Comdr. Pettyjohn's primary research in the field of gas engineering has concerned the production of carbureted water gas, the use of bituminous, coking and non-coking coals and crude oil as water gas generator fuel, and evaporation and heat transfer.

Comdr. Pettyjohn's first service with the Navy overseas (1941) was as gunnery officer with a naval transport. He was later put in charge of an amphibious naval base in the South Pacific, after which he was assigned to head the section dealing with inspection and research on both solid and liquid fuels, in which capacity he has been in close touch with the work of the Bureau of Mines. Comdr. Pettyjohn holds the Navy Medal for gallantry.

Mr. Yellott will leave the Gas Institute on May 1 to become director of research with the Locomotive Development Committee of Baltimore, Md. A mechanical engineering graduate of Johns Hopkins University, Mr. Yellott served as director of the department of mechanical engineering at Illinois Tech for three years before taking the directorship of the Institute of Gas Technology. While at Illinois Tech he also directed the Engineering Science and Management War Training program.

Obituary

FRANKLIN H. NICKERSON, retired vice-president and trustee of the Consolidated Edison Company of New York, died March 30 at his home in Redding, Connecticut.

Mr. Nickerson retired on September 11, 1944, his sixty-fifth birthday, since regulations of the Consolidated Edison System Companies provide for retirement at that age. His business career was of the "telephone and mail clerk to vice-president" type.

All except three of Mr. Nickerson's forty-seven years of service with the Edison System Companies were spent in accounting, statistical and financial work. He was made vice-president in charge of finance and statistics of the Consolidated Gas Company in 1929. Since the 1936 mergers which brought about the present corporate set-up until his retirement, he was vice-president of Consolidated Edison Company responsible for regulatory, statistical, tax and related matters. For many years it was his duty to make a continuous study of the financial requirements of the gas and electric companies in the Edison System to determine needs for working capital and other purposes. He frequently testified in court proceedings and in hearings before the Public Service Commission in merger, rate and capitalization matters.

Mr. Nickerson had been a trustee of the Consolidated Edison Company of New York since 1936.

DELLA L. CORDERY, home service consultant in the Newark, N. J. commercial office of Public Service Electric and Gas Company died of pneumonia April 15. At the time of her death she was chairman of the Industrial Nutrition Committee of Essex and West Hudson Counties.

Miss Cordery received her B.S. at Drexel Institute, Philadelphia, and did graduate work at the University of Pennsylvania. She was appointed director of home economics of the Atlantic City Gas Company in 1930 and was transferred to Newark in 1938.

ELLWOOD M. ROWAND, JR., a mechanical engineering consultant for DuPont in Wilmington, Delaware, and member of the American Gas Association since 1926, died February 21. Prior to his eight-year affiliation with DuPont, he was associated with the Philadelphia Electric Company. His home was in Swarthmore, Pa.

Born in Camden, N. J., 48 years ago, Mr. Rowand was a graduate of Lehigh University. In addition to the A. G. A., he was a member of the American Society of Mechanical Engineers.

He is survived by his wife; a son, Robert E., U.S.N.R., a student at Jefferson Medical School; a daughter, Doris R., a junior at Pennsylvania College for Women, Pittsburgh, and by his parents, Mr. and Mrs. Ellwood M. Rowand of Haddon Heights, N. J.

WALTER S. MEANY, for the last twelve years commercial manager of the Public Service Electric and Gas Company in Jersey City, N. J., died April 8 at the Jersey City Medical Center after an illness of two weeks. He was 57 years old.

Mr. Meany was born in New York, but had lived in Rutherford, N. J., for some time before moving to Jersey City five years ago. He had been employed by Public Service for thirty-five years. Mr. Meany was a member of the Jersey City Rotary Club and the Knights of Columbus.

A. G. A. Pays Tribute to the Late A. B. Macbeth

IN recognition of his distinguished career and valuable contributions to the gas industry, the Executive Board of the American Gas Association at its March 29 meeting passed a resolution recording its sorrow at the loss of Alexander B. Macbeth, an Association past president, who died March 20, 1945. The resolution, which will be engrossed and presented to Mrs. Macbeth, said in part:

"In addition to serving on the board of directors of many of the outstanding business and banking concerns of California, Mr. Macbeth gave generously of his time to many of the outstanding civic activities of Southern California. He served as a trustee of the Stevens Institute of Technology and as a trustee and treasurer of the California Institute of Technology. He was president of the Natural Gas Association of America in 1911 and of the Chamber of Mines and Oil in 1925.

"He has served the American Gas Association in many capacities since its formation in 1918—in committee work, as a director, and as its president in 1926-1927. In rendering such service, he was always ready, willing and generous in giving of his best to forward the interests of the gas industry.

"Now therefore, be it resolved that with a high appreciation of his outstanding ability and his record of achievement in the advancement of the gas industry, and with the deepest appreciation of his high moral character and his sincerity in all of his dealings with his fellowman, we, the members of this board, do hereby record our highest regard for our friend and associate, Alexander B. Macbeth."

EXPORTATION OF NATURAL GAS

(Continued from page 205)

nite if and when the occasion should arise.

There was a time when it was feared that the timber resources of this country would be depleted and the nation find itself without sufficient lumber to meet its essential needs. These fears have been dissipated with the advent of new building materials, such as concrete, tile, brick and, more recently, glass and plastics. It is not improbable that natural gas as fuel will experience a similar history.

Texas must do all things needed to prevent the waste of natural gas and oil, but while doing this it must also encourage the widest possible market and use for them. In this way, and in this way only, will it realize the full value of these important resources.

Two Cooper-Bessemer Veterans Promoted

PROMOTION of C. M. Bovard from the position of chief draftsman to design engineer and the elevation of Ralph H. Schlosser to chief draftsman is announced by The Cooper-Bessemer Corporation, Diesel engine and compressor manufacturer.

Mr. Bovard is a veteran of 20 years of service with the company and Mr. Schlosser has served in the company's drafting room for 31 years.

Personnel Service

SERVICES OFFERED

Management Engineer—Services immediately available for duration of manpower shortage. Extensive experience in production, distribution, maintenance, rehabilitation and management. **1490.**

Engineer with broad technical and executive experience covering the design and operation of manufactured gas plants, distribution, original cost, and plant record studies. **1491.**

Interested in substantial connections. Will organize a selling organization to market products with merit. Many years of experience selling every type of appliance, contacting utilities, wholesale and retail trade in various territories. Ability to promote **sales** successfully. Only interested in exclusive rights. Post war planning. Kindly mention territories now available. **1492.**

POSITIONS OPEN

Test Engineers; Research Engineers: Design and product development engineers for gas cooking appliances. Previous experience desirable but not necessary. Technical education essential. **0411.**

Gas Engineer—a well established consulting organization in New York has opening for gas engineer qualified to undertake economic studies, planning and design of manufactured gas plants and systems. Applicants please submit experience record, education, age and salary required. **0412.**

Test Engineer—Gas and electric range manufacturer requires the services of an experienced engineer familiar with A. G. A. testing laboratory procedures. Mechnical engineer preferred with knowledge of construction and testing for research laboratory. Permanent position. State age, experience and salary desired. **0413.**

Experienced **Home Service Director** to organize and supervise a combination gas and electric Home Service Department for a combination company in Ohio. Furnish full information on education, training, experience, references, age, health and photograph of self. **0414.**

Gas Engineer experienced in designing and testing. One familiar with water heaters preferred. State experience and salary desired. **0415.**

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